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CONTENTS.

A Canker on Plumbing 261
New England Notes 262
Want Higher Wages 262
Mechanical Cleaning 263
Milwaukee and Wisconsin News 264
A Plumber's Diary 265
Wants City Sanitary Engineer 265
The Principles of Heating and Ventilating Public Buildings 266
Fifteenth Annual Convention of the National Association of Canadian Plumbers 269
Pacific Coast Comments 271
Business Management 272
The Power of Suggestion 272
About That Coin Received for the Estimate 272
What is the "First-Class" Man Worth? 272
A Few Words from "Deacon Dodger" 273
The Gas Company and the Plumber 273
The Ten Best Books 273
Some Good Books to Read 273
A Practical Manual of Steam and Hot-Water Heating .. 274
Questions and Answers 276
Vibration in Water Pipes 276
Heat Losses Through Concrete Walls 276
The Potter and the Plumber 276
"Domestic Engineering's" Cartoon on "The Dangers of Underestimating." 277
The D. T. Williams Valve Co. Buys Bickford Drill & Tool Co.'s. Plant and Business 278
The Haines, Jones & Cadbury Co. Buys Oldest Plumbing Supply House in the Country 278
Personal Mention 278
The Manufacture of Plumbing Goods on the Pacific Coast 278
Enameled Tanks in the Making 279
Descriptions of Air and Priming Cocks 279
The Metal Market 280
A Buying Movement in Pig Iron 280
An Uncertain Copper Market 280
Pig Tin Cornered 280
"Sanitary Pottery" 280
Associational Progressiveness in Pittsburgh 281
The North Shore Master Plumbers' Annual Outing ... 282
Contracts Awarded 283
Patents 284
Classified Advertisements 56
Index to Advertisers 58
"Domestic Engineering's" Buyers' Guide 62

A CANKER ON PLUMBING.

What Shall We Do About It?

In a certain large city in the United States, and one of the first to adopt a plumbing code, there has grown up a practice among some of the plumbing inspectors familiarly known as the "$10 per stack" tribute, which, unless stamped out, bids fair to undermine the plumbing business and bring it into worse repute than it has ever experienced. Stripped of all its polite-sounding phrases and laid bare in all its ugliness, the practice is nothing more or less than a system of "graft," in which the contracting plumber pays and the inspector accepts the sum of $10 per stack, on condition that the tests prescribed by law shall not be required and that prohibited goods may be used. This is a matter in which the public, the contracting plumber and the easy-going inspector are not alone interested. The honest plumbing inspectors—and they are in the vast majority—are likewise affected, or are liable to be, by this dishonest practice. The object of a department of plumbing is to safeguard the public by seeing that the requirements of the plumbing code are lived up to. **If this department proves unfaithful to its trust and the public does not get the protection it is paying for and expects, then there is no further use for maintaining the department, and sooner or later it will be abolished.**

Let us explain clearly where we stand in this matter. Plumbing laws and plumbing inspectors have been important factors in bringing about the present high class of plumbing work, not only in the large cities where they are in force, but throughout the length and breadth of the land their influences have reached to the remotest towns and villages. To be forced to abolish the department of plumbing inspection would be a retrograde movement and a deplorable one, yet the abolition of the department would be far preferable to the retention of a corrupt one.

If the practice of graft is allowed to survive in large cities and spread to the smaller ones, a pretty state of affairs will confront the master plumbers.

It is due to efforts of the plumbers, both journeymen and masters, that plumbing laws and plumbing inspection were adopted. The aim of the plumbers was to prevent skin work, thereby bettering the business for all concerned and insuring the public of a plumbing installation about which it need not worry. Under the graft system, how does that work out? The public is burdened to maintain an expensive department which does not protect. Therefore, the public gets nothing in return. The work of the journeymen plumbers is lessened and they are cheated out of their just amount of labor. The master plumbers have created a Frankenstein monster which injures their business and levies tribute on them at will. The responsible manufacturer suffers, for he is called upon to compete with underweight goods, which do not come up to the standard, and the whole business, from apprentice to manufacturer, is injured by the nefarious practice. **The only one who profits is the dishonest inspector,** and for him affairs could not have been better had the various associations such an end in view when they first brought about the inauguration of a department of plumbing inspectors.

That is the situation which confronts you, and now what are you going to do about it? Sometimes in order to save life a limb must be lopped off. Why not apply the same remedy to plumbing inspection, and to save the department cut out out the graft? As a means to this end we would suggest that when framing a plumbing code a provision be incorporated making the discovery of leaks, light-weight goods or other defects in an installation passed by an inspector conclusive evidence that he has not performed his duty, making the discovery of two such evidences of dereliction of duty within six months act as a peremptory cause of discharge, and requiring that upon word being sent to the head of the department that work improperly done has been passed a special inspector be sent immediately to examine and test, with a view of ascertaining the truth.

With such a law in force and the journeymen plumbers' union closely watching all work to see that their men are not cheated of their just due, there would be fewer politicians in that and other cities looking for positions as inspectors and openly boasting they cared not for the salary, that what they were after was the money to be made on the side.

"Brown has wired me to send him up some fishing tackle."

"A nuisance, isn't it?"

"No, that isn't it; but I can't remember whether he favors Scotch or rye."

Sunday School Teacher—Now, Johnny, why do we put a penny in the plate to-day?

Johnny—'Cause there ain't nuthin' smaller.

NEW ENGLAND NOTES.

The Leonard, Gannon & Leonard Co., Wallingford, Conn., is enjoying an unusually busy season. They are doing the plumbing work at the F. A. Wallace property, 101 South Main St.; the plumbing work at the Keeler residence on North Main street and the plumbing work at the J. W. Welch house at the corner of Elm and Ward streets. Another large contract which this firm is working on is at the residence of Miss M. A. Shipman at Northford. At this house they are not only doing the plumbing work but also the heating work.

Arrangements have been made for the establishment of a class in plumbing at the Connecticut state trade-school at New Britain, Conn. and if a sufficient number make application this branch will be taken up with the opening of the fall sessions. Any boy or young man residing in the state of Connecticut is eligible to attend the school, there being no charge for tuition.

The H. C. Lowell Co., Stratford, Conn., has the contract for placing a new heating plant in the Washington school. The contract calls for a Lord & Burnham boiler and a considerable amount of piping together with a number of radiators.

The Charlton, (Mass.) school-committee has awarded the contract for heating the new grammar-school building at Charlton City, to C. T. Winter, of Southbridge, Mass.

The contract for the heating and ventilating system to be installed in the new Franklin school at Stratford, Conn., has been placed with the Fuller Warren Co., Boston.

Moffet & Riva, Berlin, N. H., have been awarded the contract for the plumbing and heating in Charles Holt's new residence on Washington street. They also have the contract for the plumbing and heating of Charles Lessard's three-apartment house on York street.

George H. Winchester, Helliston, Mass., has just completed the installation of a heating plant in the residence of Arthur H. Gooch, on Concord street, and has a similar contract at the summer home of L. E. P. Smith, at Phipps Hill now in hand.

The Heating & Plumbing Co., Norwalk, Conn., has the contract for the plumbing of the new $20,000 residence, which is being erected on Elmcrest terrace in that city. The same concern has just been awarded the contract for laying 1,400 ft. of sewer, gas and water-pipe for P. W. Brooks, who resides on the West Rocks road. The connection will be made in Ward street, the piping being on Mr. Brook's property.

D. F. Austin, plumber and tinsmith, Belchertown, Mass., is having new and improved quarters fitted up and will move into them within a short time.

The district committee of the Union City, Conn., schools has awarded the plumbing contract for the Prospect-street school to John M. Page & Co. The contract includes the laying of a one and one-fourth inch water-pipe and all sanitary sewer-connections.

Carlson & Bensen, Bridgeport, Conn., are doing the plumbing in three houses which George Nordling is building on Summerfield avenue, for Charles Beach. One of the houses is being trimmed, another is roofed in and the third has just been started.

The bankrupt stock of Buck & Greene of St. Albans, Vt., comprising hardware and plumbing supplies, has been sold by Trustee John Kearney to E. F. Paige, Concord, N. H. Mr. Paige intends to open the store and dispose of the stock at retail.

The Lee Brothers Co., of Concord, N. H., has been awarded the contract for the plumbing for the new historical society building in that city.

An additional $13,000 has been voted by the Springfield, Mass., city government in connection with the new group of municipal buildings which are in process of construction. Of this amount $10,000 is to be used for heating purposes.

E. F. Paige, of Concord, N. H., has purchased Buck & Greene's plumbing business at St. Albans, Vt.

WANT HIGHER WAGES.

Journeymen steamfitters at Cleveland, Ohio, have asked for increase in wages from $4.00 to $4.50 a day.

Mechanical Cleaning*

By G. B. F. Owen.

One of the more important developments and one of the latest in this history-making epoch is Mechanical Cleaning. With the advent of larger, more beautiful, more complex and more expensive buildings came the problem of keeping them clean, not so much from an economic point as to meet the physical difficulties presented. As the best ideas are frequently of humble origin, so this great industry had a very modest beginning. It was a railroad-car "hostler," or cleaner, who, after spending many years in the effort to dislodge dust and dirt from car-cushions and other furniture in the ordinary way, conceived the idea that it might be possible to use compressed air, which is a common adjunct to every railroad yard; to blow this dust and dirt from his cushions instead of beating and brushing them. Greatly to his surprise the work was much better done and in much less time.

A patent was taken out in the early '80's, since which time over 1,200 patents have been allowed, all pertaining to this great modern industry. For many years after the issue of this patent, intelligent effort was made to popularize the subject, but it was not until more recently that it became a commercially valuable proposition.

A striking evidence of this is the fact that less than four years ago, the architect who would consider mechanical cleaning was a rarity, the opinion seeming to obtain that even the most improved and scientifically perfected system now known the world over under the name of "vacuum cleaning," was a fad, or a toy, or an experiment, or something for the very wealthy, but not worthy of serious consideration.

Today, however, the architect is still more rare who does not provide for vacuum-cleaning in his plans and specifications for any building, from a residence to the state capitol. Following the development of a crude idea, through all the stages of experiment, elaboration and simplification into the position it now occupies among the world's utilities, and which is daily becoming a greater necessity, is a most interesting phase of history.

As soon as it was proven a success, capital and brains vied with each other to participate in the opening of a new field. As in all such cases an immense variety of ideas was put forth and more or less elaborately and intelligently exploited, until the market became flooded with everything that could be suggested from the original system of high efficiency and rapid operation, adapted to every class of building and every character of interior surface of furnishing down to the exaggerated hand-syringe, which even in this day of enlightenment is offered to an unsuspecting public.

As no chain can be stronger than its weakest link, so no vacuum-cleaning system can be better than its least efficient part. Such a system properly designed may be said to consist of five distinct elements, each of which must be scientifically adapted, not only to its own functions, but to every other part of the system. These elements may be considered as follows:

1. Vacuum-Producer.
2. System of Dust-Separation.
3. System of Automatic Control.
4. Vacuum-Conduits.
5. Cleaning Tools.

In addition to the structural features above named, there are several vitally important matters that must not be overlooked, for instance: Automatic control, without which no system today is tolerable. Until the perfection of this device, the engine and pump were started by the engineer and ran continuously whether sweeping were being done or not, until he stopped them. Vacuum consumes power, power costs money and the only control available was such as is known as "engine regulation," which governs its speed to a certain extent, but at no time shuts off the power completely. Automatic control, on the other hand, enables the operator of the tool at any distance from the plant to absolutely and automatically open and close the steam-supply in exact proportion to power needed for the actual work done. In a word, when actually sweeping, power is used and is automatically supplied, but during any intervals of inaction, whether momentary or of longer duration, the steam is automatically shut off, while at the same time a predetermined maximum vacuum is available at the tool at all times, whether power be shut off or not. It also preserves a uniform degree of vacuum per tool, regardless of the number of tools in use, shutting off power in a six-sweeper plant, five-sixths of the time, if but one tool be in use, and automatically supplying power as more tools are added. This will average a saving in cost of operation of about 50 per cent as against the types lacking this important feature.

Dust separation, in many cases, is accomplished by drawing the dust-laden air through a body of water or past a spray-nozzle. Modern refinement in the art seems to show that this water-separation is both unnecessary and undesirable; unnecessary, because dust can be separated and is being separated from the air without any water whatever; undesirable, because it takes about one-fourth more vacuum than is necessary to do perfect cleaning, to pull this dust-laden air through a body of water, and vacuum costs money.

Keeping in view the important fact that vacuum costs money because it requires power, it is easy to see that every inch of vacuum-conduit from tool to tank should be smooth and unobstructed throughout. This means something better than ordinary pipe-fittings, or even than drainage fittings, neither of which type was primarily intended for vacuum-work, and for this reason special fittings had to be designed and made for this service.

Cleaning tools of every conceivable shape and material have been offered. Many of them seem totally unfit in design and operation for the work expected of them. It is really a fine art to differentiate between the good and the bad in the matter of cleaning tools. Experience in this as in most other cases is the best, though sometimes the most expensive feature.

Until recent years mechanical cleaning has never been accomplished without the use of more or less cumbersome and costly machinery. Either a vacuum-pump or an air-compressor, operated directly by steam, or indirectly by electricity, was a part of every such equipment. These complications, translations, transmissions and deviations in the use of power caused losses in all directions, aggregating 80 to 90 per cent. This in itself was very costly. The machinery and installations were necessarily expensive.

The wear and tear on the machinery in the old-style vacuum systems is very great, especially in the valves and cylinders of the vacuum pump, where the entrained dirt-laden air soon cuts the sliding parts and utterly ruins

*Reproduced by the courtesy of Ald. John H. Jones and Ald. Fred A. Britten, editors of "A Half-Century of Chicago Building."

them. It is safe to say that no old-style vacuum-cleaning in use in any part of the country has maintained its full efficiency for six months after installation. The modern system has neither engine nor pump and maintains its highest efficiency indefinitely.

Outside the question of price of plant and its maintenance comes the cost of operation. The real question should be "How much will it cost to operate a one-sweeper plant one hour?" or, "How much coal will be needed to produce a sufficient vacuum to operate a one-sweeper plant one hour?" (A one-sweeper plant means a one-man operated plant, and "sufficient vacuum" would mean a vacuum of sufficient intensity to operate the largest cleaning tool properly.) Answering this question, would say that with steam at 100-lb. pressure the maximum cost per sweeper-hour should not exceed 5½ cents. This, under very ordinary conditions of fuel cost and boiler performance, will enable a man, woman or boy to sweep and clean four times the surface ten times better and in a hundredfold more sanitary manner than is possible with brooms and carpet-sweepers.

By a strange coincidence, the year that gave us the first United States patent on mechanical cleaning devices, also marked the period at which the scientific world first published the result of its work in tracing the origin of many infectious diseases, and today it is a scientifically demonstrated fact that dust is the most prolific source of disease and death among mankind. Sweeping with broom and brush and more particularly the process known as "dusting," gets rid of only such matter as is large and heavy enough to be classed as "dirt," while most of the finer and more dangerous "dust" is merely raised into the air, held for a time in suspension and then settles back on walls, furniture, books and floor.

Indoors dust contains a far larger proportion of germs than does the air out of doors, which is in larger volume and more or less constantly moving, so diluting the germ-laden air that the actual number of living organisms in a given volume is on the average very small, while in a recent test made in a school-room in one of our principal cities, the dust that settled on 100 sq. ft. of surface was collected and weighed and the number of germs or living micro-organisms, found in this amount of dust, 22/100 of an ounce, was 38,250,000 millions.

From the original desire to clean car-seats evolved the ability to clean carpets, rugs and upholstery. Mechanical ingenuity, never willing to stand still, saw that its sphere must be extended to uncovered walls, floors, ceilings, draperies, and in fact the whole interior of a building. Practical tools were designed for each of these uses, so that the same system with an almost instantaneous change of cleaning tools can perform equally good work on any surface and in the most inaccessible places, and we find this great utility has earned its way all over the civilized world and in to practically every class of building that is kept clean. Its source of power may be almost any form of kinetic energy, of which the usual commercial types are steam, electricity, gasoline or even water.

In its development from the work in a railroad car to that of a large building, new problems constantly presented themselves and had to be met. This fact, perhaps more than any other, called forth persistent effort to adapt the appliances to new conditions, so that today we have buildings containing 1,000,000 sq. ft. floor space to be cleaned and there are tools with which to do it, tools that sweep in both directions and also at both ends, while sweeping a swath 36 in. wide and about 4 ft. long at each motion, and 6,000 sq. ft. of floor space an hour sanitarily and completely cleaned by one man is neither impossible nor unusual. The inevitable result was that architects, contractors and owners became deeply interested in the subject. Inquiries from all parts of the country became so numerous and showed such a dearth of tabulated information as to what should be demanded in a vacuum-cleaning system that a sort of standardized specification became necessary, that the busy architect might have in his reference-library a concise form suggesting the points to be covered in drawing his plans. So we see that vacuum-cleaning has assumed its place in the commercial world, not only as a twentieth-century necessity, but has evolved into the dignity of an industry with its own specifications and in this, as in many other lines of endeavor, the "I will" spirit of Chicago has produced results that are the admiration of the world.

MILWAUKEE AND WISCONSIN NEWS.

Milwaukee is to have three public comfort stations. Competitive plans for stations costing about $4,000 are to be received and a jury of competent architects will select the plans, prizes being awarded for the best designs. At a recent meeting of the public-building committee of the city council it was decided to erect these stations at Juneau park, the Grand avenue bridge and at the Sixth-avenue viaduct. It is the desire of the committee to have the plans prepared at once, so that there will be no delay in going ahead with the work.

M. R. Hawthorne, a plumber at Green Bay, Wis., has entered a complaint with the city authorities, claiming that he has been treated unfairly by the plumbing board in the way of an examination.

The Laursen Automatic Pump Co., Eau Claire, Wis., has filed articles of incorporation with the secretary of state. The capital stock of the concern is $200,000 and the incorporators are: W. E. Plummer, L. M. McCumbe, L. A. Laursen, William Grahn and F. R. Farr.

Bids have been received by H. E. Briggs, commissioner of public works of Milwaukee, for complete steam-heating systems to be installed in each of the engine houses number 4, 5 and 6.

Building Inspector E. V. Koch, of Milwaukee, has suggested that public-comfort stations be arranged in the basement of the city hall and in the public-library building, rather than erect new structures as has been planned. He states that he will make this suggestion at the next regular meeting of the city council for the consideration of the aldermen. However, among the citizens, this plan is not meeting with much favor and it is believed that the original plan to erect three stations, one in Juneau Park, one at the Grand-avenue bridge and another at the Sixth-avenue viaduct, will be carried out.

Careless and faulty inspection of sewers is said to have been discovered by Public Works Commissioner H. E. Briggs, of Milwaukee. The city is doing a large amount of sewer work on the south and west sides and it seems probable that there will be a shake up in the inspection force.

A sewage-disposal plant for Milwaukee in the Town of Lake is contemplated by persons who have made a study of the problem of sewage disposal. George C. Whipple, New York; Harrison P. Eddy, Boston, and J. W. Arnold, Chicago, who constitute the commission which was appointed to devise improved sewer conditions for Milwaukee, are at present in the city and have commenced arrangements for making a final report to the city council. Conferences have been held with the city engineer and health commissioner. The commissioners will inspect the Menomonee valley as far as the county line and inspect the proposed site for a disposal station in the Town of Lake before beginning sittings on the preparation of their report.

Among the recent heating and ventilating contracts secured by the Mueller Co., Madison, Wis., are the following: Heating and ventilating for the Biology building and heating for the Engineering building of the state university, heating and ventilating for the new First National bank-building, the Ninth Ward school and the Father Petit parochial school.

George F. Reeke, Green Bay, Wis., is installing the plumbing and Martin & Wigman the heating plant in the new Brown county court house at Green Bay.

A PLUMBER'S DIARY

BY PHOENIX

XIII.

Whereby Certain Master Plumbers Prove the Truth of the Old Story, "A Penny Saved Is a Penny Earned."

Sept. 20.—There were three places that I could jump to at the close of the cracked-boiler episode, and as two of them lay pretty near to each other I concluded to go North and into the state of Minnesota and see how they managed plumbing and steam-fitting in the great wheat-state.

Therefore I soon landed in a small city in the state mentioned. I shall not soon forget my first impressions of the place, the clear and bracing air, the activity and energy of the people and the prairie-chicken for supper, with a big slice of pickerel on the side, from one of the many small lakes not far from the town.

They certainly live well up there in Minnesota, if you do pay a good price for what you get. The party, for whom I was to work, had a whole bunch of jobs and few men at hand and it was getting along in the time of the year when the people were beginning to think about the heat for the winter. Up in that land 10 deg. below zero feels like a summer's afternoon in June (sometimes). So it was, get out and hustle, boys, each and every moment, and all for $3.00 a day.

You see us all a-hustling, don't you, for that price? Well, I reckon. The cold weather must have had the effect of pinching up the conscience of the master, for I never saw a stingier man before in all of my life. Seemed to be sorry to see night come, for it didn't give him any chance to be charging down something against somebody, or docking the men.

He was so afraid that the men would stand still a few moments and take time enough to figure, where they were going to come out, that he had the steam boiler set up in one of the large buildings that he had to heat and took no measurements as to the height of the basement and the run of the steam mains. Wouldn't let any of the fitters go near the job, until the mains were ready to run. Then it developed that the boiler had been set about 11 inches too high, and the very Old Nick was to pay.

Take it all around with the wasted material, the lost time and the new foundation supplied, I expect that it cost that old duffer some $25 or more to make good that piece of stinginess, where if he had let a fitter go and lay the job out it might have taken the fitter four or five hours.

Why didn't the master do it himself, you ask? **He did.** That was it. Couldn't fire himself, could he? And it was certainly one on him. So that was one place, where he saved a few pennies—and wasted 25 "bucks" at the very least. He certainly had an eye to business, yes, no? Well, figure it out for yourself.

He had, also, besides the work ahead, a raft of half-finished jobs scattered all over the community, upon which there was more or less to be done. I never saw a more mixed-up mess up to this time. He would pull a man off here and send him to three or four other jobs all day long, day after day. A man would not more than get his kit unpacked and nicely to work, when there would come along the shop wagon and it was up and away to some other place to turn a trick and keep the owner from kicking too hard.

It was surely a jolly life we all led, and I began to take on weight riding around so much in the fresh, pure air and sort of free and careless-like, for no responsibility devolved upon me, as I was not put out to start a single job. I expect that I might have lingered longer in that town but for the greed of the master. It happened like this:

One evening I appeared at the shop half an hour before quitting time, and do you know that old skinflint had the nerve to dock me two "bits" on pay night, which was on Saturday eve? Now under the ordinary circumstances a man would have had to submit or quit and loaf until he could connect with another job.

Right here is where the benefit of my correspondence system again showed that it was a good thing in time of need. I stopped no longer in that town than to pack up my things and moved out to a city about 50 miles down the line where there was a party with whom I had been having some correspondence, and he had told me to come on any time in the next two weeks.

Now some may advise against this constant skipping around to so many different places, but it sure does get a person wise in many ways. One may not save so much money, but carfare don't cost as much in good hard plunkers as does whisky, and I guess that I saved a little above the average and still managed to ride "first class." I liked the change at any rate, and under my system the jobs seemed plenty.

I started to work for the people in the town, to which I jumped so suddenly, on Monday morning, and to make the story shorter, I stayed with them exactly one week.

They were good people, in one sense of the word. They paid good wages, had plenty of contracts and fine tools. However, they were always finding fault. Didn't rave and cuss as some do, but had a keen sarcastic manner of talking which made a fellow feel mean, no matter if he had done a good job. Always wanted a little more than you could possibly give.

I never heard a man praised in that shop the week that I was there, and so when pay night came I made up my mind to quit the place and jump straight to one of the larger cities of the farther west and see if I could not make a hit and stay through the winter, at least.

WANTS CITY SANITARY ENGINEER.

Mayor Baehr, of Cleveland, O., is of the opinion that his city should employ a sanitary engineer in the city building-inspection department, whose duties it should be to examine building plans with a view to determine if proper arrangements have been made for plumbing fixtures. In making this suggestion to Public Safety Director Hogen he points out the alteration that is now in progress regarding the plans for the interior of the court house. "Architects cannot be expected to know everything about plumbing work," he says. "I believe that the city could save its people thousands of dollars by employing an engineer to study plans submitted. See the changes that were found necessary at the court house. If the plans of the architects had been given this study in advance of construction this might have been avoided."

The Principles of Heating and Ventilating Public Buildings

By Alfred E. Wheeler.

*The Henry Saxon Snell 1909 Prize Essay. Published by courtesy of the Royal Institute of Sanitary Engineers of Great Britain.

Continued from page 214, Sept. 3rd issue.

Radiators should be of a type easily accessible for cleaning, and have plain surfaces. Especially is this necessary in the case of hospitals and similar institutions. It is also a good practice to have radiators constructed without feet, carried on cast-iron brackets built into the wall. By this arrangement no obstruction is offered to cleaning underneath. Baffle-plates in cast or wrought-iron should be fixed to the radiators to direct the fresh air over the surface, and these should also be easily removable for cleaning.

Each radiator should be fitted with a valve on each connection, and with a union-fitting, so that any radiator may, if necessary, be removed without interfering with the working of the remainder of the apparatus. An air cock should also be fitted near the top of each radiator to release accumulations of air.

All main pipes not actually used for the radiation of heat should be covered with a non-conducting composition, as this results in a decided economy of fuel.

An open tank having a capacity of at least one-twentieth of the whole volume of water contained in the entire apparatus should be placed in a convenient position at least two feet above the highest point of the circulation system to accommodate the increase of volume due to the heating of the water in the system. The water-level in this tank should, of course, be very low when the apparatus is cold. The pipe connecting the expansion tank with the system should be without a valve or obstruction of any kind. A cold-water supply should be connected to the tank controlled by a ball valve.

Each boiler or calorifier should be fitted with a safety valve weighted to a pressure of about 5 lb. in excess of that due to head of water. Other useful fittings are an altitude gage which automatically registers the loss of any water from the apparatus, and a good thermometer on each flow and return connection, registering the heat loss on each circuit.

Forced Circulation.—To renew the heat lost from the radiating surfaces, requires a certain definite quantity of water supplied to each radiator per hr. at a given temperature. This, it has already been pointed out, is accomplished in the case of the gravity system by the head created by the difference of temperature between two columns of water. It may also be accomplished with far greater certainty by the forced-circulation system, in which the water is pumped through the main pipes and service pipes. The forced-circulation system is independent of all considerations of levels, and can be pumped in any desired direction. Next to temperature the governing factor in a forced circulation is velocity, which determines the sizes of the pipes necessary and the amount of power to drive the pumps. Far more care and skill, however, are necessary in the successful design of a forced-circulation system than for any other system, as the total resistance in each circuit must be approximately equal, otherwise short-circuit troubles will inevitably ensue, as many inexperienced engineers have found to their cost.

Properly designed, however, no system can equal this most modern method for heating from a central plant, scattered blocks of buildings, extended over a wide area. Hospitals, workhouses, infirmaries, lunatic asylums, and other scattered institutions of a like nature, which are now usually heated by this system were formerly heated by means of a separate calorifier situated in each building and supplied with steam generated by centrally situated boilers, and delivered to the various buildings in cast-iron mains, the water of condensation being returned by a second main.

The writer has in mind an instance of an institution consisting of 26 pavilions heated in this way, requiring the use of 26 calorifiers, the whole of which might have been done from one calorifier by the forced-circulation system, the pipes which were necessary for conveying the steam and condensed water being used for the hot water, and the saving in first cost and upkeep would have been very considerable. Large institutions such as those already referred to have usually a large quantity of exhaust steam available from laundry and other engines, boiler-feed and water-service pumps, and often electric-light engines. This exhaust steam, together with that discharged from the circulating pumps, is quite as valuable as live steam for heating the water in the calorifier, and utilizing this, otherwise a waste product, results in a considerable saving. The writer could mention many instances in which practically whole institutions are being heated by such waste steam, free of cost for heat.

The cost for working has been frequently advanced against the use of the forced-circulation system but it should be pointed out that in the case of a steam-driven plant the actual cost for steam is nil, as a portion of the steam required for the calorifiers is diverted through the pump-cylinder, performing useful work on the way in driving the pumps to circulate the water. Then there remains only the cost of maintenance of the pump and working cost, but this is amply compensated for by the reduced first cost of the plant, and by the decreased radiation from the connecting mains, the sizes of which are curtailed very considerably. Heat-loss from these surfaces is always a considerable proportion of the coal bill. If the radiation is reduced by one-half, the annual coal-loss from this source is necessarily reduced 50 per cent also.

In the case of hot water being circulated by an electrically-driven pump or other external agency the complaint has perhaps a little more foundation, but as an electrically-driven pump requires no more attention than an ordinary ventilating fan and merely requires the movement of a switch to start it, and the wear and tear of a good pump and motor being very small, the heat-saving due to the reduction in the sizes of pipes will usually be found to save the cost for electricity in the reduced coal bill.

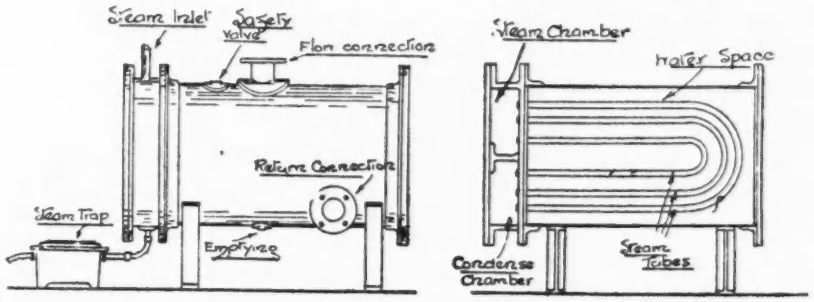
The forced-circulation system will therefore be found to be most suitable for all institutions extending over a large area, where large bore-pipes are an objection, or

where the levels are such that the gravity system is impracticable.

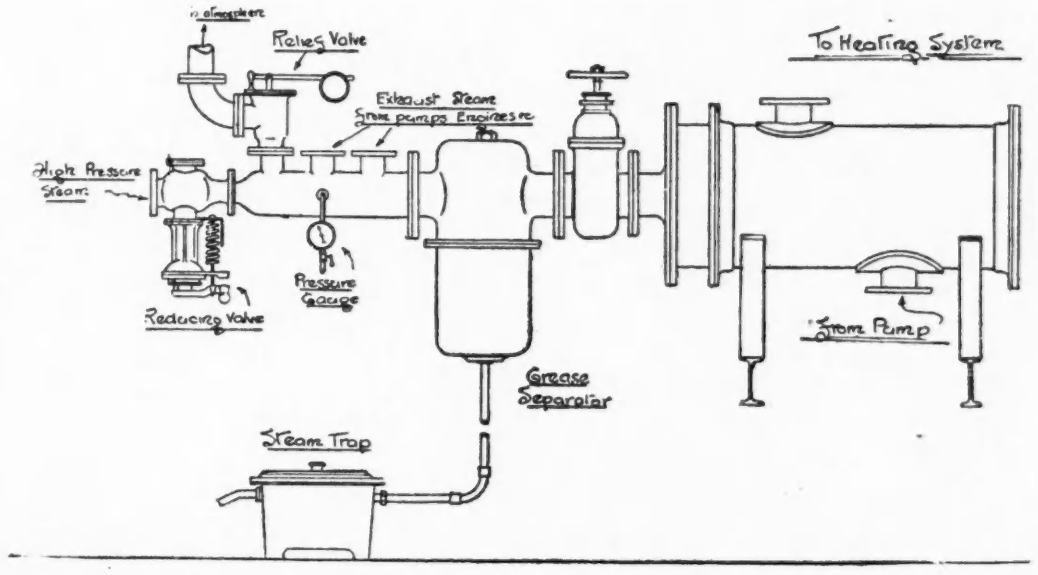
Steam Heating.—Each of the systems described in the preceding pages has its parallel in steam heating. For isolated plants we have the low-pressure steam gravity return system. For large scattered plants the steam is generated and distributed to the various points at high pressure, and reduced to the required pressure by a reducing valve, or the circulation of the steam is accelerated by a vacuum-pump.

Low-Pressure Steam Gravity-Return.—In this system keeping a fairly steady pressure and temperature in the apparatus. A main steam-pipe is taken from the boiler and returns to the same carrying the water of condensation by gravity back to the boiler to be re-evaporated. Radiators are employed in exactly the same way as described for hot-water system, with fresh-air inlets behind. Each radiator must be provided with a valve on each connection, and an automatic air-valve. The latter valves are constructed with a plug of expansive material, usually vulcanite, which open to air and close to steam, thus preventing steam flowing from the apparatus. The working of these

Steam Calorifier



External View Internal View



Arrangement of Heating Plant for Forced Circulation
Utilizing Exhaust Steam

the steam is generated in cast or wrought-iron boilers similar to those which have already been described for hot water heating. The boilers are fitted with a pressure-gage, water-gage column, and a safety-valve, and are also provided with an automatic arrangement for controlling the fire-dampers by means of the pressure generated in the boiler. This arrangement accelerates the fire as the pressure falls, and retards the fire as the pressure rises, thus

little valves often leaves much to be desired, but is the best arrangement at present in use. The position of these valves is near the bottom of the radiator, as air being heavier than low-pressure steam drops to the lower part of the radiator by gravity. A similar valve should also be fixed on the steam main, in a position beyond the service to the farthest radiator, to free the main of air.

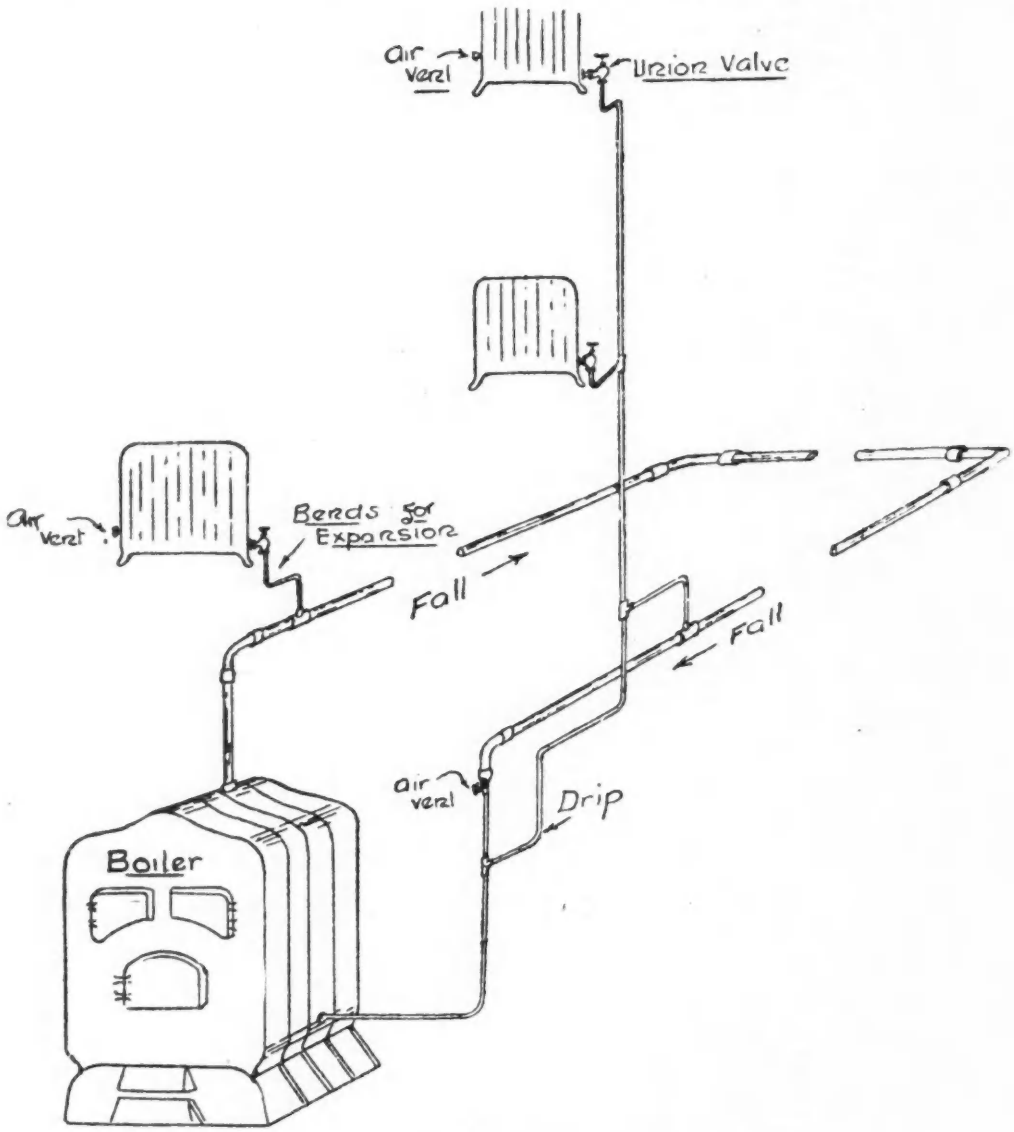
The advantages of a low-pressure steam heating system

have already been referred to, but unless designed with considerable care much annoying noise may result from the action of the condensed water. The best system of piping for low-pressure steam heating is debatable, and it has always been a controversial point whether two connections to a radiator, or one connection to carry both the steam and the returning condensed water are best, but after considerable experience the writer is unhesitatingly of the opinion that the latter method gives the best results. The pipes should, however, be arranged with as little horizontal run as possible, given as great a fall from the radiator as can conveniently be done, and the pipe-sizes kept amply large, that is, approximately one pipe-size larger than would be the case for hot water. When a vertical main supplies a number of radiators the rising pipe should also be drained at the bottom into the main condense-pipe returning to the boiler.

Reduced High-Pressure Steam.— When steam is carried to extended blocks of buildings and the pressure reduced as required by reducing valves, the high-pressure steam should be carried at as low a pressure as possible, as although the pressure is reduced by the valve the temperature remains nearly the same owing to the superheated condition of the steam.

All that has been said with respect to the gravity-return system applies equally to this system with the exception that the end of the main condenser-return is connected to a steam trap and the discharge taken to a hot well or tank for returning to the boilers as hot feed-water.

(To Be Continued)



Low Pressure Steam System.

A hobo looking through a barber shop window saw a customer having his hair singed.

"By jinks," he said, "looking for 'em wid a candle!"—New York American.

Fifteenth Annual Convention of National Association of Canadian Plumbers

Held in Toronto, Ontario, August 31, September 1 and 2, 1910

The fifteenth annual convention of the National Association of Master Plumbers and Steamfitters of Canada was held at Toronto, Aug. 31, Sept. 1 and 2, 1910, it being in many respects the largest and most important gathering in the history of the trade in that country. Where in 1908 there were only 15 and in 1909 only 30 delegates and visitors in attendance, there were over 100 this year, the size of the gathering being well illustrated by the group photo taken on the first day before many of the delegates had arrived.

About four years ago the plumbing trade in Canada received a body blow in the court decisions fining the members of the Toronto association and declaring their organization illegal. Up to this year it has been impossible to form a new association in Toronto, although the trade conditions have been intolerable. At last, however, about 120 have been gotten together in Toronto and the holding of the national convention in Toronto has not only given local plumbers encouragement but has been the means of starting a movement to organize a new Provincial association.

The last three national conventions have been held in Montreal and to the members of the Montreal association credit is due for holding the National Association together during the troublous times of the past three years. And credit for bringing about a re-organization at this time is almost wholly due to the assistance of the "Plumber and Steamfitter of Canada," which has persistently urged the necessity of organization when the most optimistic in the trade had lost heart. Although no notice of this year's convention was issued except through the Canadian trade paper, delegates were present from about forty towns from Montreal to Vancouver.

A peculiar situation exists in Canada in that the manufacturers and supply-men, instead of encouraging the work of organization have placed obstacles in the way of bringing the trade together. For instance, at previous conventions the master plumbers have been content to allow the supply-men to provide the entertainment. The Toronto committee this year decided to be more independent and not place themselves under obligation to the supply-men. Consequently they arranged to hold a trade exhibition and sell space to the supply-houses, etc., desirous of assisting, no donations being solicited. Some firms responded promptly but the Supply-Association held a meeting and the members agreed to boycott the exhibition. When it was seen that the convention was an assured success, some of the boycotters took space, with the result that the secretary of the Supply-Association visited the exhibition hall and ordered these members to withdraw their displays. This situation has developed a very strained situation between masters and supply-men but with the trade determined to reorganize it is easy to see the supply-men "get theirs" if they continue in their present attitude. If organization is good for the manufacturers and supply-men it surely ought to be for the masters.

List of Those Present.

The following delegates registered during the convention:

Vancouver—C. Weeks. Calgary—E. J. Young and J. Marr. Montreal—J. Watson, J. E. Walsh, J. A. Gordon, H. W. Munday, Walter Ryan and L. Conroy. Toronto—G. H. Cooper, R. J. Shannon, L. LeGrow, H. Hicks, F. Maxwell, D. Glynn and G. F. Franklond.

Hamilton—W. J. Clark, of Adam Clark & Sons, Frank Chapman, Wm. and Fred Gooderham. Brantford—Chas. Taylor. Paris—J. Cunningham. London—J. Eggett, L. J. O'Dell. St. Thomas—C. E. Bull and E. D. Dickson.

Chatham—R. McG. Coyle. Stratford—H. J. Peters and A. E. Sylvester. Goderich—W. R. Pinder. Galt—T. Lockhart. Inglewood—A. Spratt.

Collingwood—J. A. Caslake. Niagara Falls—F. F. Heximer. Ridgeway—B. F. Zavitz. Burlington—J. T. Mathews. Peterboro—R. J. G. Sutherland and R. G. Sturgeon.

Trenton—Jas. FitzPatrick. Belleville—W. B. Geary. Brockville—Geo. Ross. Aurora—Stanley Richards. Port Hope—T. W. Millward. Barrie—J. J. Neelands. Orillia—H. J. Andrews.

Bracebridge—A. S. Bates. North Bay—J. E. Farrell, S. J. Cherry and A. E. Lasalle. New Liskeard—J. Murphy. Haileybury—F. R. Gibson.

Sudbury—D. S. Humphrey. Port Arthur—W. B. Sime. Fort William—E. E. Higginbotham. Guelph—H. Mahoney, A. Malcolm, H. E. Bates and G. E. B. Gringer. Ottawa—H. A. Knox, F. G. Johnston, H. Chandler, J. T. Band and J. Thorp Blythe.

Mayor Welcomes Delegates.

In the absence of President Joseph Lamier, Montreal, owing to illness, Vice-president G. H. Cooper, Toronto, opened the convention, addresses of welcome being delivered by Ex-Presidents Robert Ross, Toronto, and J. A. Gordon, Montreal, Mayor Geary, Ald. McGuire, R. W. Dockeray, G. E. Gibbard and L. L. Anthes, Fred Armstrong replying for the delegates.

The committees appointed were as follows:

Credentials—J. A. Gordon, Montreal; F. Maxwell, Toronto and W. B. Sime, Port Arthur.

Resolutions—E. J. Young, Calgary; C. Taylor, Brantford, and Jas. FitzPatrick, Trenton.

Press—L. LeGrow, Toronto; W. J. Clark, Hamilton, and E. D. Higginbotham, Fort William.

Select—J. E. Walsh, Montreal, A. Malcolm, Guelph, and E. D. Higginbotham, Fort Williams.

Audit—G. Ross, Brockville, R. J. G. Sutherland, Peterboro, and A. E. Sylvester, Stratford.

Nominating—Wm. Mansell, Toronto, J. E. Farrell, North Bay and F. G. Johnston, Ottawa.

President Laurier, in his report recommended the appointment of a permanent paid secretary. Vice-president Cooper referred to the progress made in organization work in Toronto during the past year. Secretary Munday referred to the assistance of the trade press in the work of organization.

Ontario Vice-president Shannon referred to the adoption of new plumbing by-laws at Hamilton and London and the necessity for a by-law covering the Province.

Treasurer Mahoney reported a balance on hand of $236.98.

J. E. Walsh, vice-president for Quebec, regretted that "master plumbers, generally speaking, have not ceased the thankless and fruitless struggle of price-cutting. Competition is assuredly the life of trade but by competition is undoubtedly meant honorable rivalry and above board and financially productive business methods. It might be too much to expect that saner business methods will readily be introduced by all but it is not improbable that the majority will soon awaken to the truth of the folly of securing work at any price. With the dawn of that day—let us hope it will not be retarded—our association will surely have special advantages to offer which added to the magnetism of both fraternal and business ties should happily spell success for the future."

The Montreal branch of your National Association is carefully considering among others the following subjects: The elimination of the general contractor so far as the technical plumbing and heating trades are concerned. The revision of the official selling price list for jobbing work. Amalgamation with the Builders Exchange. A study of existing conditions in order to ascertain the most efficient manner of conducting a plumbing business, special attention being given to the exact cost of running expenses, and to the proper percentage to be added to insure a definite and tangible profit.

J. E. Walsh, Provincial vice-president for Quebec, suggested that it might prove a wise plan if at every future convention a few hours were allotted to the discussion of the best means to be adopted by the different locals to arouse enthusiasm among their members. An exchange of ideas with due allowance for local conditions should tend to the advancement of the main body through its branches. Our national association is emphatically opposed to most business concerns in as much as it practically owes both its existence and maintenance

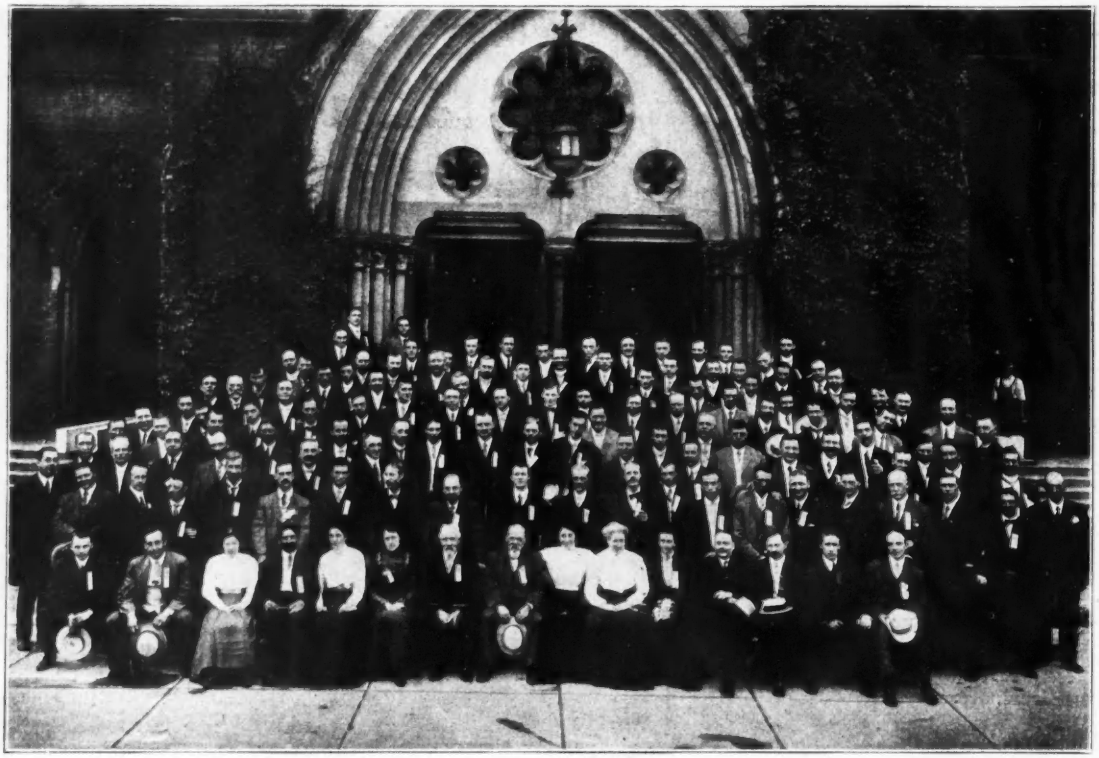
to its branches. Is it not therefore our bounden duty to give our best thoughts to the parts which constitute the whole? Let the officers and delegates at the ensuing conventions come prepared to answer at least one of the following questions:

Is your Association in the rut and if so for what reasons?

Did your Association succeed before and if so, by what means?

How can your Association, if in the rut, be placed on a substantial footing?

Devote all your energy to the locals. Build up the locals and the main body is built. In the building up of the locals, due discretion, however, must be observed. For what does it avail to establish smaller sub-locals in provinces where the principal city local is dead? How long will they survive? Make the principal local, I mean the local of the largest city, a success, so that the sub-locals of smaller cities and towns can readily be established or, if already established, be simply prepared to continue in line eager to grasp the advantages offered them. Far, however, from advocating the destruction of the sub-locals, let us expand not in a slipshod manner but slowly and surely. Begin with the foundation but make the foundation solid before adding to it.



The 15th Annual Convention of the Canadian Master Plumbers. Held in Toronto, Aug. 31, Sept. 1 and 2, 1910.

E. J. Young, vice-president for Alberta, said that the past year or two had seen a great advance in the plumbing and heating business of the West. In his own home city of Calgary, a movement was started in 1908 towards the organization of a Master Plumbers and Steamfitters Association, and starting with a membership of nine has grown until all the firms engaged in the plumbing and heating business in the city were enrolled, giving a total membership of twenty firms. We are now compelling every applicant for a Master's license, to pass both a theoretical and a practical examination before being eligible to receive this license. We also do the same thing in regard to the Journeymen, and have found that this examination tends very strongly to a much better class of plumbing work, and the elimination of the slipshod manner of installing sanitary appliances. The examining board is composed of three members, the plumbing inspector, a master plumber chosen by the association, and journeyman plumber chosen by the local union. The license fee for a master has been raised from $5 to $20 and for a journeyman the license fee is $5.

I am pleased to be able to state that our sister city in the North, Edmonton, has also formed an association, on lines similar to the Calgary one, and it is meeting with a very gratifying measure of success. In the opinion of the Alberta plumbers as a whole, association work is the logical solution of all the difficulties that beset the path of the plumber and we are endeavoring to not only have a local association in each city, but when all are in line, to have a Provincial association. In furtherance of this, we are using all our efforts to have local associations formed in each center of business, and we have great hopes of success, our last report from Lethbridge being to the effect that they are seriously considering organizing there. If this is done, it will mean that Alberta will practically be completely organized, and by the next National Convention I hope that my report will be of the Provincial work done, as well as the Municipal. Taking it all in all, the plumbing and heating business in Alberta is in a very promising and flourishing condition, particularly in Calgary and Edmonton, where the results of association work are visible on every hand, and bear testimony to the value of a thoroughly and well-conducted organization.

The Sanitary Committee in its report referred to the need of Provincial sanitary by-laws and inspectors to see that they are properly enforced. It is very difficult to properly master an epidemic in a large city when the outskirts of the same city have no sanitary by-laws or if they have are not enforced.

The Legislative Committee reported in favor of securing a charter incorporating the master plumbers association as the Canadian Society of Sanitary and Heating Engineers.

The Apprenticeship Committee referred to the assistance given by the Montreal association to the technical classes at Montreal in which plumbing practice is taught.

The Resolutions Committee commented favorably upon the necessity of plumbing inspectors, master plumb-

ers and journeymen passing examinations and also upon the advisability of securing Provincial regulations governing plumbing work outside the large cities and towns which already have by-laws.

After a lengthy discussion it was decided to lay over for the consideration of the new executive officers the motion that the name of the association be changed to the Canadian Society of Sanitary and Heating Engineers.

Election of Officers.

The Nominative Committee's selections were accepted without change as follows: President, G. H. Cooper, Toronto; vice-president, J. E. Walsh, Montreal; secretary, Lewis LeGrow, Toronto; treasurer, E. D. Higginbotham, Fort William.

Provincial Vice-Presidents—Nova Scotia, Frank Dexter, Truro; New Brunswick, G. E. Blake, St. John; Quebec, H. W. Munday, Montreal; Ontario, R. J. Shannon, Toronto; Manitoba, R. Thomson, Winnipeg; Saskatchewan, A. D. Henrichs, Moose Jaw; Alberta, E. J. Young, Calgary; British Columbia, R. C. Hodgson, Vancouver.

Chairmen of Committees—Legislative, H. A. Knox, Ottawa; Sanitary, Geo. Ross, Brockville; Apprenticeship, Jas. Griffin, Montreal; Essay, J. E. Farrell, North Bay.

It was decided that the next convention would be held at the "Twin Cities," Port Arthur and Fort William, at the head of Lake Superior, early in June, 1911.

During the convention two meetings of the Ontario delegates were held to consider the question of reorganizing the provincial association which went out of existence four years ago. R. J. Shannon, Toronto, was made convenor of a committee with instructions to circularize all the master plumbers in Ontario and call another convention in Toronto on Thanksgiving day, the third Monday in October.

At two sessions of the convention, time was given to a discussion of trade evils and manufacturers and supply-men were censured for encouraging unfair competition. J. E. Farrell, North Bay, said too much time was devoted to good fellowship and too little to business. The supply-men and travelers, he contended, should be told to keep away from the convention for the first couple of days. Pleasant days at the convention may mean many hard ones at home. The association should be run on strict business lines, every report being submitted in typewritten form on association stationery. More time should also be given for essays on trade subjects.

James Marr, Calgary, introduced motions condemning the use of traps with hidden tongues and non-accessible hidden overflows and the motions were adopted unanimously after discussion.

On motion it was resolved that master plumbers wherever possible, become members of the local board of health.

A moonlight excursion on Lake Ontario on Wednesday evening, a theater and supper party on Thursday evening and automobile rides for the ladies were the chief social events.

Amongst the exhibits were noticed displays made by such United States firms as Standard Sanitary Manufacturing Company, Toronto, Canadian Wolverine Brass Manufacturing Company, Chatham, Ideal Manufacturing Company, Detroit, and Honeywell Heating Specialty Company, Montreal.

Nelson & Metzler, Red Wing, Minn., have been awarded the contract for the installation of a steam-heating system in John Vollmer's hotel in that city. Consideration $850.

Chas. Stoll & Son, New Ulm, Minn., have been awarded the contract for the installation of hot-water heating and plumbing systems in F. H. Retzlaff's new residence in that city.

W. E. Bouillon, Lincoln, Ill., has secured the contract for the plumbing and heating of the new Odd Fellows building at Middletown, Ill.

Moffett & Riva, Berlin, N. H., have been awarded the contract for the plumbing and heating of Charles Holt's new residence on Washington street, and the contract for the plumbing and heating of Charles Lessard's apartment-house.

PACIFIC COAST COMMENTS.

Now that work has been commenced upon the laying of the cast-iron pipe-line for the auxiliary fire protection system in San Francisco, a dispute has been started among the unions as to which one has jurisdiction over part of the operation. The Labor Council has been called upon to settle a dispute over the calking and it has been decided to have the American Federation of Labor pass on the question, the water workers retaining the jurisdiction in the meantime. The plumbers' union made a determined stand to obtain the approval of the council but the consensus of opinion is that the water workers are entitled to the jurisdiction as the plumbers have never before claimed control. As this work is now under way a speedy decision is asked from the American Federation of Labor.

On the evening of August 27th, the San Francisco Master Plumbers' Association gave an entertainment at its hall for the members of the organization and a highly enjoyable evening was spent by those present, numbering about 150. In addition to a program rendered by amateur talent among the members a moving picture machine was secured and a fine lot of films was run off, together with some lantern slides prepared specially for the occasion. Light refreshments were served and the entire evening was given over to enjoyment.

City Attorney Long has just handed down an important opinion informing the Board of Public Works that the Equitable Light & Power Co. had the right to lay pipes in the streets of San Francisco for the purpose of supplying patrons with steam and hot water for heating purposes, without obtaining a franchise for the privilege. He bases his opinion on an article of the State Constitution allowing any one to lay pipes for the supplying of fresh water for domestic and other purposes, when certain regulations in regard to the proper repair of the streets are followed out. The fact that the water to be served is to be hot or in the form of steam does not, in his opinion, make it necessary that a franchise be secured.

The revenue cutter, Golden Gate, is now having new boilers installed and at the same time a change is being made to the oil-burning system, this having proved entirely satisfactory on other local vessels belonging to the government. Other government vessels on the coast will be equipped with oil-burning apparatus but the Navy Department has just issued a statement to the effect that nothing would be done in reference to a similar change in regard to battleships, owing to the fact that fuel oil can be secured in so few places.

The Turner Co., San Francisco, has secured a contract for installing the heating apparatus in a three-story building being erected by R. Pahl on Hyde street, near Post. A. A. Laib will install the plumbing system in this structure.

After having been left in a ruinous condition ever since the fire, with the exception of some repair work to the steel frame, the Rialto building at New Montgomery and Mission streets, San Francisco, is to be constructed at an early date. Plans have been drawn up for the work and bids for the installation of plumbing, heating and vacuum systems will be called for at once.

The San Joaquin Hospital Association is planning to erect a large hospital at Stockton and this will require a large amount of plumbing and heating work as the project is a large one. Work will be commenced on the buildings within the course of the next two months. S. L. Dickinson is president of the association.

The plumbing shop of W. J. Bowman at Chico, Cal., was damaged recently by a fire that did extensive damage at that place.

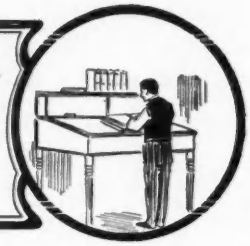
Plans for the new public-comfort station at Long Beach, Cal., have been about completed and it will soon be constructed at a cost of about $10,000.

N. F. Bower, a plumber located on South Flower street, Los Angeles, has been awarded a contract to install a new plumbing system in a four-story hotel on Broadway, owned by Mrs. Eugenia Porter.

H. J. Crawford, Los Angeles, has secured a contract to install the plumbing work in an addition being made to the Colegrove school at that place. The contract is valued at $1,425.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



THE POWER OF SUGGESTION.

Editor "Domestic Engineering":—I've got a few thoughts that I desire to cut loose from, and as they will not work in with the other stuff and this is approaching the busiest season of the year for the shops and some good may come of it I'll shed right here. You know that things don't change much in our business. I have in mind a certain show window and floor stock that was fixed up finer than dandy some 18 months ago. It at once attracted all kinds of attention, and the people could be seen nights stopping to look at that most attractive display window. Apparently the effort busted the energy and the imagination of the master plumber, for, from that day to the present writing he has not changed the position of one blamed fixture. The dirt and dust are allowed to accumulate on the fine enameled pieces and several sheets of nasty dirty looking fly-paper adorn (?) the same show window.

I wonder if this man realizes how such a thing as absolute **filth** strikes the passer-by? Apparently not, for he makes no change. Does this man realize for a moment that he is, every day, gaining a notoriety for being one of the most slovenly men on the street, where his business is? Does he realize that in not having a more extensive display, frequently changed about, that he has lost the power of suggestion to the customers' mind? That same power of suggestion is about the greatest business getter that each merchant has. You buy a bath-tub, we will suppose. What would that suggest—provided that the articles were properly shown—it suggests a soap-dish, a towel-rack, a seat for the tub, a shower-bath, the lavatory likewise suggests a soap-dish, another towel-rack, a looking glass, racks for tumblers and many other things, too numerous to speak of here.

Now, were these things properly brought to the customer's eye and suggested to his mind, it's a dead cinch the man, or woman, would buy some, if not all of the articles mentioned.

It's the same old thing over and over again. One plumbing shop is as similar to another, the country over, as two peas are alike. One show-window ditto. I was interested in reading an article by Edward Moss, in the paper of August 27th, but that man seems to me to be all tangled up in the scenery. He says that the master should have a show-window all fitted up with an up-to-date complete bath-room outfit. Blame it all, anybody that "lives in town," or has traveled at all, knows, full well, just what a good bath-room **is**—Why not show them what it ain't?

Why not have something different? Are we so poor in ideas and so limited in regard to fixtures that we must rely on the same old chestnuts all the enduring time from now on until the crack of doom?

Mr. Moss then proceeds to cite the instance of the clothing stores, and there he has fallen all over himself, for if there is one thing, in which originality is shown at all, it is in these stores. They too have what might be called a solid staple line to display. What I mean is it's all clothing. So we might say with a similar meaning, it's all plumbing. Observe the different effects and combinations the clothing merchants get into their windows (with the same stock), and do you, Mr. Plumber, absorb the hint and put on your thinking cap and originate some suggestive ideas.

"Phoenix."

ABOUT THAT COIN RECEIVED FOR THE ESTIMATE.

Editor "Domestic Engineering";—Mr. "L" in the August 20th issue of your paper seems to think that when he settles up "the money is there, even if it is not itemized." Seems to me to be a case of "now you see it and now you don't"—mostly "don't," I reckon. Of course he gets something on the jobs that he lands. What about those that he loses? That's what I want to know. If a man lands two out of five jobs that he figures upon, he is doing a blamed sight better than the average, I take it. Now where does the pay for the time on the three lost jobs come through in Mr. L's idea? Does he make the two contracts pay for the three he lost? I don't think that I would care to pay five or ten dollars just for the sake of having Jones know the prices. If I wanted anything myself I would be willing to pay, just as I would have to do to the lawyer or the doctor as cited in a previous issue. What I am trying to get at, is to get some returns for the many, many lost hours of professional time, that we masters give away. Time that is valuable and that we can never buy back. No one yet has ever turned time backward. If a man puts in 10 hours a week, that he does not get paid for, and it runs for 50 weeks, he has lost 500 hours.

Figure it at merely a good journeyman's wages (50 cents an hour), and you have the neat little sum of $250., which I claim a man should attach unto himself. Perhaps this letter will make plainer what I seem to have fallen down on in the previous communication. "L" may consider that he gets his pay, but I'll be darned if I can see where it comes in.

"N. R."

WHAT IS THE "FIRST-CLASS" MAN WORTH?

Editor "Domestic Engineering":—I shall take the greatest of interest in this series for it is a question of great importance to the business. In the first place there are not enough good men to meet the demand, by far. This, of itself, should put a good price on the article, but from the many peculiar happenings of the situation, it does not always obtain. A good man is worth a certain per centage of what he can create. But he doesn't always get it in this business, any more than he does in any other line of business in the affairs of life, speaking generally.

The boss says, and you see it in all the "ad's" "We have a good opening for an enterprising young man, with the best aspects **for future advancement."**

That same bait has hooked more suckers than would crowd the pike from 'Frisco to Chicago. Why not pay what the job is worth right on the start? The position is worth the price if the applicant isn't. A place of this kind is worth $50.00 a week at the start. With a two

weeks lay off to rest the mind that amounts to only $2,500. a year; and the same energy, experience, responsibility and real worth invested in some other lines of business would bring the man twice $2,500.

Many bosses have bright dreams about the future but are mighty shaky about the present. Present prospects are what look good **now.** We may all be dead 10 years from to-day and think of the wad of money that you failed to get, for services rendered.

Detroit, Mich. Vim.

A FEW WORDS FROM " DEACON DODGER."

Editor "Domestic Engineering":—I observe a paper by Edward Moss in a previous number of your valuable paper. Say Mr. Editor, is that name real, or assumed? or is it merely "typical"? To hear him talk one would be lead to believe that all us plumbers were the most ignorant class in existence. He has made some great breaks in that article, Mr. Moss has. He says that the average owner does know something about the cost of the lumber, etc., about a house, but doesn't know much about the cost of the plumbing. I only wish that Mr. Moss could get a hold of some rich old hen who had more money than she knows what to do with, and he would find out very soon how wise she was in regard to prices. I tell you, that it's fierce and that you can't beat it in any other trade in existence. Why, if they did not know, they are dead sure to get next from the mail-order houses. A customer no idea of the cost of plumbing work? The very idea makes me smile. Why, what are they spending their money for? What do they have from two to ten different men bid on the work for? You bet your life that the customer **has** an idea and a mighty good one too. It is not always best to put the prices in the show-window either. In the largest and most expensive stores in the dry goods lines I notice that the prices are made known privately and not put in the windows. Suppose a master put a bath-tub in the window with the price marked on it $100 or $300, as the case might be.

"Good Lord!" the public would say, "but that plumber **is** a robber." When you come right down to the real thing, it is all in the man himself. Some men will take a catalog and sell more goods than others can with the best and most complete stock to show from. I have seen this same thing done too many times not to know what I am **talking** about, and so on these points I can not agree with Mr. Moss, salesman, estimator and superintendent. though he be.

Deacon Dodger.

THE GAS COMPANY AND THE PLUMBER.

Editor "Domestic Engineering":—I was very much interested in reading in a previous number of the paper about "The Hold of The Gas Company." As a general proposition most of these gas companies have simply been forced to take up the sale of these appliances in self-defence? The plumber has, at all times, been slack and very negligent about making a new field (or even, sometimes in cultivating old fields), and the sale of gas has changed materially in the last few years. A much greater amount is used for fuel, whereas in past years it was used for lighting purposes. Now the care and the worry of looking after the men and the sales and of doing what strictly belongs to the plumber and fitter is a matter of no small consequence to be considered. If a man can go to the gas company and offer a clearly demonstrated proposition to conduct matters, he may stand a chance to break into the game. Most men in the business are not good-enough business men to swing a big game of that class.

I am well aware that some party will jump up and feel slighted when I throw out such a hint, but it is a fact. Now, if you should go to many a gas company with such a plan, you would have to prove to them that you could do better with the business than they could. I know of a man that really did this very thing. He became a general contractor for gas. He handled the whole shooting match from start to finish. Made a good thing for himself, for the company, and built up a business from a little shack to a fine business block, and all in less than five years. What one man has done, another can do also. It is a matter of good system, stick-to-it-iveness and having the proper amount of confidence in yourself. The field is broad enough, but is the plumber or fitter big enough to properly cultivate said field?

Pittsburgh, Pa. "Alleghany."

THE TEN BEST BOOKS.

Editor "Domestic Engineering":—I see that one of your readers has been asking for the ten best books on heating and plumbing. I wonder if he knows that the field is quite small and the money invested in a library would be a comparatively small amount? Take the list that you publish and foot up the whole blamed shooting match and it amounts to less than $50.00, and when you come to compare this amount with the sum that a lawyer or a physician has to invest to have a source to fall back upon, or to keep up with the times, it will be seen that the sum total is so small that it is a shame to not possess the books. Many masters seem to think that if they have $10.00 "tied up" in books that they are going to go broke immediately. If they would invest and recommend the reading of some of the excellent books to their journeymen, there would not be so many bum jobs on the market as there are. A well-posted journeyman is the masters' best asset and they are slowly finding this fact out. May their number increase!

S. B.

SOME GOOD BOOKS TO READ.

Editor "Domestic Engineering":—In considering the ten best books there will be a variety of opinions, some of which will be due to the different conditions which govern the individual who makes the selection. I consider that in the plumbing field the works of Mr. Cosgrove are about as helpful as any, fully as complete and also written in an easily readable style, and that the matter is so arranged that it is not hard to understand; while, for a small and highly instructive book your "Plumbing Catechism" would be hard to beat.

As for the heating, I have always found that Carpenter was very reliable, but it takes quite a lot of study to be able to understand him to the best advantage. In this connection I want to state that the "Notes on Heating and Ventilation," by John R. Allen, and "The Principles of Heating," by William G. Snow, are very much to the point. I am reading the series that you are running in the paper, written by Mr. Pierce, and I have found his articles very helpful, and I am looking forward to the time when they shall be complete so that I can gather them all in one place. Trusting that some of these suggestions may prove helpful, I will close.

M. M.

SECTION XIX.

In using the table Y herewith repeated it must be distinctly understood that it applies only to a standard friction equal conditions of 100 ft. of straight pipe. Every elbow, tee, globe-valve, reducing-coupling or other friction-creating agent must be considered and its equivalent in straight pipe added to the actual measured length, or serious error in the area required will surely arise.

If the pipe is uncovered, its radiating surface must be ascertained and figured as direct radiation, See Table EZ). When the length exceeds 100 ft., with the equivalent length of the fittings added, the results found by Table Y should be multiplied by one of the following factors given in Table AZ. Col- [illegible] cases lengths from 175 ft. to 1,000 ft. Col. 2 shows the percentage of area to be added to the area found by Table Y in order that the decrease in pressure shall remain the same as that found for 100 ft. by Table Y. Column 3 shows what percentage of radiation found by Table Y the increased length of piping will carry and still maintain the distance between water-line of boiler and lowest point of main pipe intended or indicated by Table Y.

TABLE AZ.

Length of Pipe When Friction Of Fittings is Added	Percentage of Area Increase to Add to Pipe, to Make the Friction Equal Table Y.	Percentage of Table Y. This Length Will Carry and Have Friction Equal
175 ft.	24 %	76 %
200 "	29 "	71 "
220 "	33 "	67 "
240 "	35 "	65 "
260 "	38 "	62 "
280 "	40 "	60 "
300 "	42 "	58 "
350 "	46 "	54 "
400 "	50 "	50 "
450 "	53 "	47 "
500 "	55 "	45 "
550 "	57 "	43 "
600 "	60 "	40 "
650 "	61 "	39 "
700 "	62 "	38 "
750 "	64 "	36 "
800 "	65 "	35 "
850 "	66 "	34 "
900 "	67 "	33 "
1000 "	68 "	32 "

To the man who desires to do good work in steam-heating houses, no more important tables will be presented than these in regard to the sizing of pipes. The use of the tables is as follows:

Assuming that on a simple job as illustrated by Fig. 12, the total amount of the required radiation, including surface of the main itself, is found to be 345 sq. ft., and the cellar is found to be so low that from point x on the bottom of the main, to the water-line of the boiler selected to use, only 4 inches can be secured. It is desired to know what size main to use if a single pipe-circuit job is put in, also what size pipe will be required for a two-pipe job.

From Table Y we learn that for only 4 inches drop each 100 ft., and fraction of 100 ft. of radiation, must be multiplied by 1.45 to find the area of pipe necessary for a one-pipe job, and for a two-pipe job the total radiation should be multiplied by 0.97 to get the correct area for 100 ft. of straight pipe.

TABLE No. Y.

To Find Pipe-Size Suitable for Varying Distances Between Water-Line of Boiler and Farthest Point from Boiler of Supply or Steam-Main.

Probable Decrease in Pressure of Steam in Oz. or Lbs. on Ordinary House-Heating Job.	Distance from Water-line of Boiler up to Main Supply-Pipe Return-End. Inches.	To Find Area of Steam-Main in Square Inches, Multiply Each 100 Sq. Ft. of Radiating Surface. One-Pipe.	Two-Pipe.	Probable Steam-Pressure Required at Boiler.
1 oz. = 1/16 lb.	4	1.4	.9	½ lb. to 1 lb.
2 oz. = ⅛ lb.	6	1.35	.9	1 lb. to 2 lb.
4 oz. = ¼ lb.	10 to 12	1.03	.68	2 lb. to 3 lb.
8 oz. = ½ lb.	16 to 18	.63	.46	3 lb. to 5 lb.
12 oz. = ¾ lb.	23 to 25	.56	.38	5 lb. to 10 lb.
16 oz. = 1 lb.	32 to 33	.45	.32	
24 oz. = 1½ lb.	46 to 48	.43	.31	

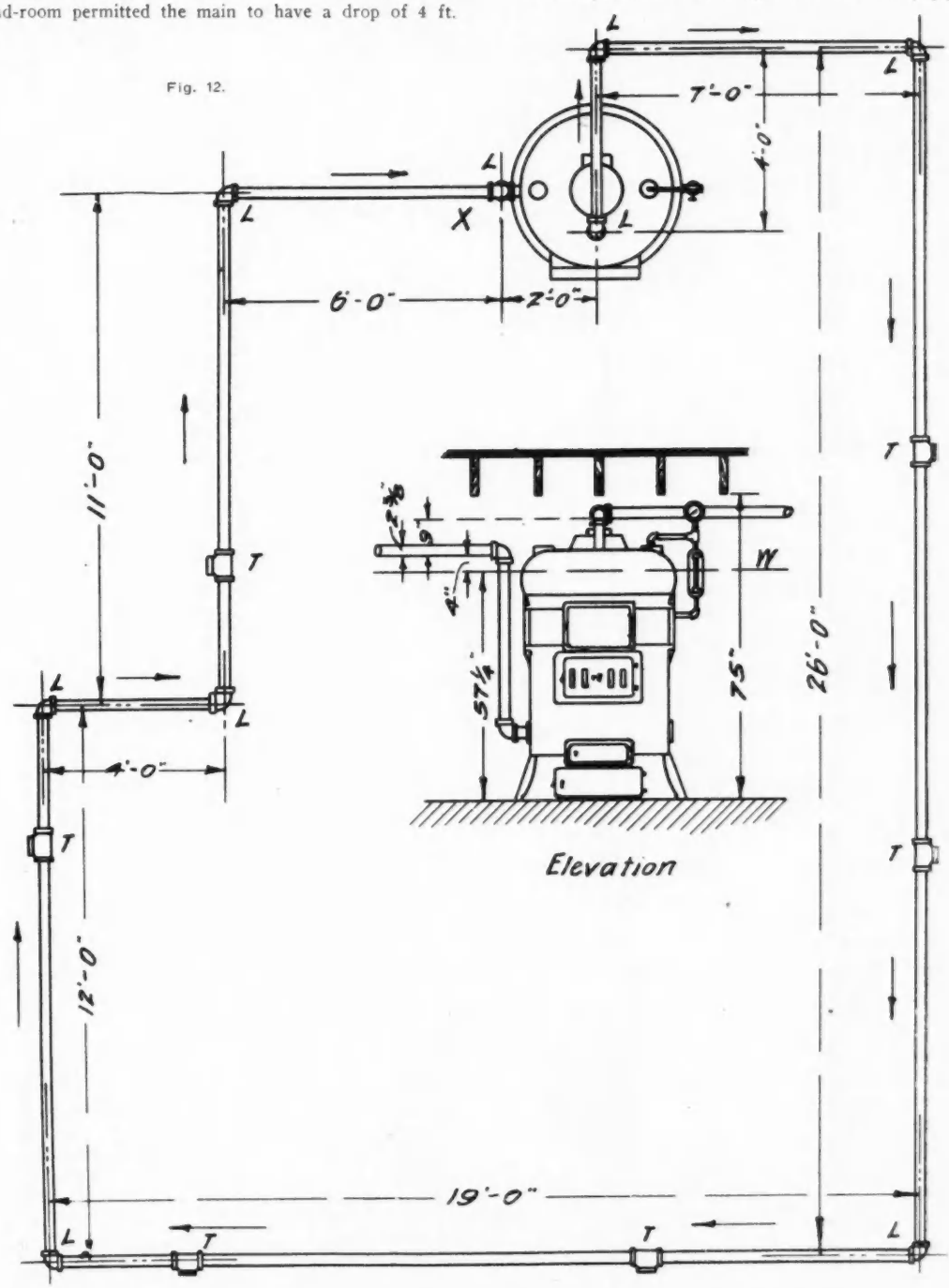
We look at the sketches and notice that on a single-pipe circuit there are 9 elbows above water-line of boiler, and 6 tees. We may also find the actual measured length of the proposed circuit to be, say, 92 ft. It is evident that in this case fittings must cut considerable of a figure. We first find out what size of pipe would be required to carry the 345 sq. ft. of radiation if the pipe had no fittings and was perfectly straight. We therefore multiply the 300 ft. and the 45/100 ft. by 1.45 to get the area of main for single-pipe circuit. 3.45 x 1.45 = 5 sq. in. The nearest commercial-size pipe of this area is a 2½-in. pipe. But this is for 100 ft. of straight pipe.

We must find out how many feet of straight pipe these fittings will equal and add it to the 92 ft. of measured length in the lay-out. Each 2½-in. elbow is the equivalent of 8 ft. 2 in. of 2½-in. pipe and each tee of 12 ft. 6 in. Then the 9 elbows are equivalent to 73½ and the 6 tees to 75 ft. more. The total length then that must be taken into account is 92 + 73 + 75 = 240 ft. Table AZ states that the area in the pipe must be increased 35 per cent to carry 240 ft. of length and provide same drop as for 100 ft. length. 35 per cent of 5 is 1.75; then 5+ 1.75 = 6.75 sq. in. area that must be provided. This area requires that a 3-in. pipe be used if a steady water-line is to be maintained.

If the height of the cellar would permit a distance of 18 in. between point x and the water-line of boiler, instead of multiplying by the factor 1.45 the radiation should be multiplied by 0.68. From Table CZ it will be found that the fittings are equivalent to a length of 125 ft. of pipe to be added to the 92 ft. of measured length, or a total length of 217 ft. The area

found to be needed by Table Y for 345 sq. ft. of radiation with an 18-in. drop is 2.346 sq. in. Table AZ gives the increase in area necessary to equalize 220 ft. in length with 100 ft. as 0.33 per cent. When this percentage is added we have the required area as 3.12 sq. in. or the area of a 2-in. pipe. In the same manner we would find the area that should be used if the head-room permitted the main to have a drop of 4 ft.

Fig. 12.



Elevation

It will be found to require 1½-in. pipe for the main if a 48-in. drop can be had. A main pipe should never be used of less area than a 1½-in. pipe.

These illustrations very clearly show that it is of the utmost importance to the fitter that he should know what distance can be secured between the low point of the proposed main and the water-line of the boiler to be selected. In fact, an intelligent selection of the piping layout or of a properly proportioned steam-boiler cannot be made without this information.

The importance of reaming the ends of every pipe can be seen in the light of this discussion. For instance, the burr which is often left when pipe is cut, not only produces a considerable amount of friction, but produces an actual reduction in the available area of the pipe itself.

(To be Continued.)

VIBRATION IN WATER-PIPES.

Editor "Domestic Engineering":—Received your plumbing book a few weeks ago and and I am well-pleased with it. One thing I can't find in there, and that is vibration in closet. We have a closet that we put in this last spring and we had some trouble with it, there is always such a rattling noise in the water-pipe and if you take a hold of the pipe you can feel it shake. It only does that when they flush the closet. As long as the ball-cock is open all the way you can't hear anything, but when the tank is nearly full and the ball-cock begins to close up, it starts in to make that vibrating noise. I went to work and took the ball-cock out and put in a new rubber disk. I thought that should help it. It did for a little while but never worked just perfect. The closet is located down in cellar. About 15 ft. of ¾-in. pipe are run over from service-pipe to closet. The closet is connected with ⅜-in. pipe taken from the ½-in. pipe.

If you would kindly let me know what should cause that vibrating in closet, I should be very much obliged to you.

Elgin, Ill. John H. Gieseke.

Following your description of the method in which the closet works, we feel that should the pressure be too heavy, this might be the cause. We would suggest that you apply a pressure-reducer and by a little experimenting, you can easily adjust the pressure to suit the conditions. It might, however be possible to place two or three rings on the pipe, anchoring them to the wall and thus do away with vibration if it is very great. In the issues of "Domestic Enginering" for 1909 the subject of pipe-vibration was discussed very thoroughly.

HEAT LOSSES THROUGH CONCRETE WALLS.

Editor "Domestic Engineering":—In reference to the loss in B. t. u. through concrete walls, I would say that until some actual standard for production of concrete has been established it will be nearly an impossible task to determine a factor that will be reasonably safe to apply.

Take the hollow-block construction for example. Hardly two contractors mix the material in the same manner, or use the same size of stone for backing. Probably no two use the same pressure in the hand machines, and this pressure has a decided effect upon the final density of the mass. Again with the power machines used for making blocks; the thickness of the fine sand covering, the size and kind of stone used for the backing will have an influence in fixing the full density of the completed block. This density to a great extent settles the question of heat loss for the concrete mass.

With poured concrete substantially the same things must be taken into consideration.

With all grades of concrete the allowance for loss from wind must be increased beyond that allowed for brick.

The density of concrete varies from that of the poorest of limestone to that of the average brick. About all one can safely say, so far as I am aware at present, is that, for hand made concrete blocks, that are water-proofed and have a 2 to 2½-in. air space, a loss of 0.20 B.t.u. to 0.31 per deg. of difference between the inside and outside air may be reasonably expected. If however, the plaster of the rooms is placed directly on the concrete without the usual furring the loss will be nearer 0.35 B.t.u. per deg. of difference.

On the loss from poured concrete walls, unfaced, I have but little data from only two or three buildings located in the Central states. On one of these the loss through a 16 in. wall was 0.41 B.t.u. per deg. difference. On the other building with a 24-in. wall there was a loss of 0.28 B.t.u., per deg. The first one was not plastered on the inside, the second one was plastered directly on to the walls of concrete. Both buildings had been waterproofed. Unless concrete has been fully waterproofed, the heating engineer had better not give any guarantee as to the heat in damp or wet weather. For data as to the effect of water on walls see "Domestic Engineering," of April 23rd, page 82, second column. Of poured concrete walls faced with tile or brick I have no personal data. But I would hardly think the loss would exceed 0.12 from a 24-in. wall to perhaps 0.22 from a 12-in. wall, if the concrete was composed of relatively small stone of good density and good quality of sand so that the mass should become very even in its density.

Belfast, Me. E. R. Pierce.

THE POTTER AND THE PLUMBER.

Editor "Domestic Engineering":—I see that you have been saying a great deal about the fitter and the plumber in the course of the last few weeks, and now I wish that you would tell us a little about one of his cousins, the potter. For my part I would like to know a little about the history of the matter and also whatever else you might see fit to consider of the most interest. I like your different departments, for they are very instructive and cover such a wide field. You are certainly making some paper.

T. S.

Speaking in a rather broad sense, we can trace the potter's art, or trade if so you wish to call it, back into the past for many thousand years. A careful reading of many writers and a careful consideration of matters seems to point to the fact that the art had its start in Egypt. This may be changed some day when some of our aggressive Americans get busy and dig up a few more ancient cities and locate them in the records of time. Many beautiful specimens, glazed and un-glazed have been found and the exquisite coloring, still preserved is a source of constant wonder to the man in the business to-day. Of course, all the other nations have taken a hand in the game and left various beautiful pieces of pottery used for different purposes, some of which may be seen in different parts of the world, in our principal museums and in private collections.

As we understand the term sanitary pottery to-day, its use may be said to date from the 19th century, from which in the past 25 years it has been greatly perfected and improved.

There are various materials used to produce this ware, the three principal being flint, clay and feldspar. It seems to be the proper combination of these substances that brings out the "class" of the goods.

"Domestic Engineering" Cartoon on "The Dangers of Underestimating." No. 11.

A Serious Miscalculation. Do They Do This in Your Town?

We are receiving requests from readers for reprints of these cartoons for framing. We will forward extra copies to subscribers to "Domestic Engineering" upon request

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NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

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Member of the Federation of the Trade Press Associations of the United States.

SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. Photographs and drawings with descriptions of special interest to plumbers and steam-fitters are welcomed. "Domestic Engineering" pays at space rates for all articles, notes, criticisms and news data so contributed.

Among the Wholesalers

WILL MAKE PIPE-WRENCHES AND OTHER TOOLS.

The Cochran Pipe Wrench Mfg. Co., Chicago, has been incorporated with a capital of $100,000 to manufacture pipe-wrenches and other tools.

THE D. T. WILLIAMS VALVE CO. BUYS BICKFORD PLANT AND BUSINESS.

The D. T. Williams Valve Co. of Cincinnati, O., has purchased the business and factory of the Bickford Drill & Tool Co., in that city. The Williams company will conduct the newly acquired business in connection with its own plant.

THE HAINES, JONES & CADBURY CO., BUYS OLDEST PLUMBING SUPPLY HOUSE IN THE COUNTRY.

The Haines, Jones & Cadbury Co., of Philadelphia, has purchased the plumbing supply business of the G. & A. Bargamin & Co., of Richmond, Va. This is said to be the oldest plumbing supply house in the United States having been established in 1827.

PERSONAL MENTION. ..

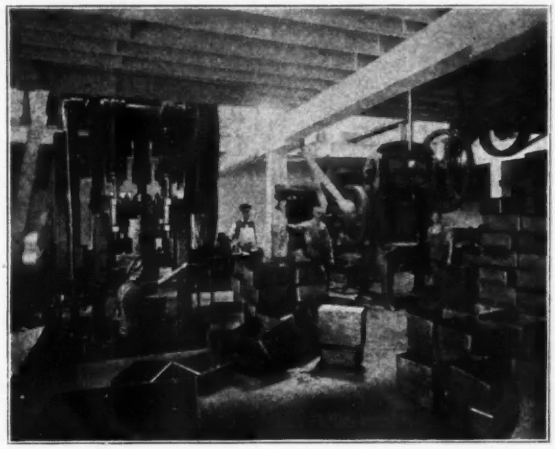
A. H. Warner has resigned from his position as treasurer of the E. Stebbins Mfg. Co., manufacturers of plumbers' brass goods at Springfield, Mass. He has not yet made any final decision about his plans for the future, but it is expected that with his thorough knowledge of the manufacturing end of the plumbing business and with his extensive acquaintance with the trade in the East he will still remain a factor to be reckoned with in the trade.

THE MANUFACTURE OF PLUMBING GOODS ON THE PACIFIC COAST.

The matter of manufacture of plumbing goods and supplies on the Pacific Coast is commencing to attract attention and it is freely predicted by various members of the wholesale trade in San Francisco that the time is but a short ways in the future until the Pacific Coast will be in a position, not only to supply its own needs in most lines, but to do considerable export business. Until recently conditions have been against manufacturing in California and buyers have become so accustomed to looking upon the East as the source for manufactured products that they are skeptical whenever the proposition of manufacture on the Coast is propounded to them. The problem of cheap power has been one most instrumental in keeping manufacturing enterprises away from this coast, but this is now rapidly being solved through the enormous production of crude oil in California and in the development of electric power in the Sierras. Raw materials are to be found there in a great diversity, and with the power question solved the advantage would be with the Coast in the manufacturing line in many ways. The mild and even climate in California permits of operations the entire year around, and costly factory buildings such as are necessary in the East would be out of place there. A start has already been made in the manufacture of vitreous plumbing ware and a factory is now in operation at Richmond, across the Bay from San Francisco. Practically all of the raw material is to be found in this state, and some of the clays used are declared by experts of the company to be superior to those found in the East. The new plant has a small capacity at the present time, but additions are being made and within a short time business will be gone after on a large scale. The demand for the local product is already such that the output of the plant for a whole year is already sold. The manager of the plant is a Mr. M. Platts, an experienced potteryman, and much of the equipment is of original design. The kilns are heated with crude oil, a California production, this being the only plant in the United States, as far as known, using this fuel for the manufacture of vitrified plumbing goods.

ENAMELED TANKS IN THE MAKING.

The manufacture of tanks is an important industry. While the tank does not lend itself to purposes of display as does its first cousin—the bath-tub, its function in domestic sanitation is so important that the greatest care must be exercised in its manufacture. There are different types of tanks offering themselves for public approbation,

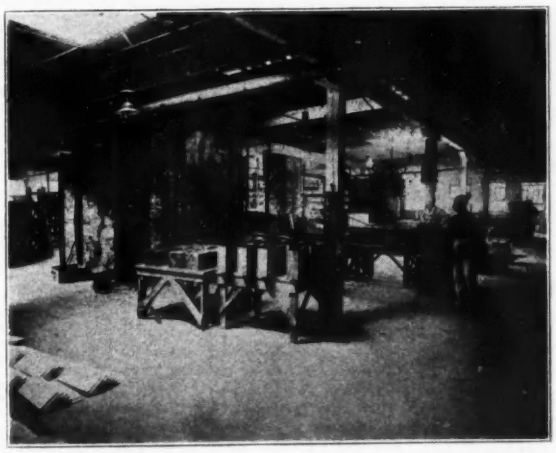


Corner in Enameled Tank Co's. Press-Room, Showing Two Tank Power Presses.

purchase and use and all types possess their specific qualifications and points of merit.

In Kalamazoo, Mich., there thrives a humming factory, busily engaged in the making of enameled iron tanks. Its official title is the Enameled Tank Co., and it has seen its opportunity in the continuous battle that is being waged between iron and steel, a battle which in all probability will continue to be waged as long as iron and steel are in existence.

The company is proud of its enlarged plant, of which we are able to show interesting illustrations of some of its



View of Enameling Tank Co's. Enameling Room.

chief departments. In these well-lighted and well-arranged rooms are turned out the company's white porcelain-enameled iron closet-tanks, turned out with ease and precision, every step in the manufacture being watched carefully and the final product being submitted to the most rigorous inspection. So confident is the company of the ability of the tanks to meet with all the strains and stresses of use that all its lines are sold under a broad guarantee.

Three essentials are required for success in the marketing of any product for which there is a public demand. Carl H. Zwermann, the president of the company, says that the "Kazoo" company possesses them all three—good material, perfect equipment and skilled personnel. These are represented in their order by American ingot iron, the home of the Enameled Tank Co., and the officers and carefully selected operatives that supervise and carry out the manufacturing operations. President Zwermann is an expert in enameling processes. From the country of chem-

Another View of the Enameled Tank Co's. Enameling Room.

ical analytical thoroughness, Germany, he came years ago, armed with the best of enameling knowledge of Europe. Since his commencing business in the United States, he has applied his learning and skill to meeting the demands

Corner of Assembling and Packing Room of the Enameled Tank Co.

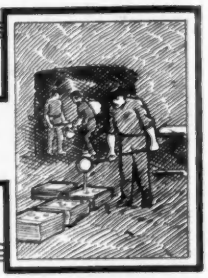
of the public under ever-changing conditions and much of the prosperity of the company is due to his wise guidance and business acumen. The company has practically doubled its output this year and reports that the prospects are even brighter for next year's business.

DESCRIPTIONS OF AIR AND PRIMING COCKS.

The Detroit Lubricator Co., Detroit, Mich., is sending to the trade literature concerning its air and priming cocks, illustrating and describing the different types of these, and literature on this subject will be furnished to our readers upon application.

The West Plumbing Co., Portsmouth, O., has removed to the old bank corner at Market and Second streets, which is in the business district of the city.

THE METAL MARKET



A BUYING MOVEMENT IN PIG IRON.

Cheerfulness has been noted among pig-iron sellers this week for there are numerous orders in the market, some large sales have been made, and the situation is apparently much clearer. It is seemingly a spasmodic outburst in all parts of the country, for in the Central West the better feelings are noted; in the Southern iron field orders have been taken with considerable freedom, and in New York there have been numerous inquiries. The largest sale was of 40,000 tons of assorted pig iron to a manufacturer of agricultural implements in South Bend. Ind. In New York a manufacturer of soil-pipe has inquired for from 15,000 to 30,000 tons, a portion of the iron to be delivered this year and the remainder next year. This will supply plans of the interests in several different states. In Chicago pig-iron sellers have inquiries for fully 50,000 tons of iron, for it is reasoned among pig-iron melters that if a large consuming interest was willing to commit itself on 40,000 tons, an interest which is known to be a shrewd buyer, the turning in the market may be near. As is usual in a turn of the market, there has been no notable improvement in prices, quotations being practically unchanged from last week. Prices are as follows:

No. 2 Southern foundry, Birmingham	$11.50 to $12.00
No. 1 Northern foundry, New York	16.00 to 16.25
No. 2X. Northern foundry, New York	15.50 to 16.00
No. 2 Plain Northern foundry, New York	15.25 to 15.50
No. 2 Northern foundry, Chicago	16.50 to 17.00

AN UNCERTAIN COPPER MARKET.

Consumers are buying copper only as their needs dictate, and there is no disposition to load up with metal for future requirements. With this, however, there is a keen watching of the market by the buyers of copper, for, should statistics prove unusually favorable to holders of copper, there will likely be a good buying movement. If the producers can hold together and restrict production from three to six months, consumers will have a great deal more confidence in the market than they have at present. The leading sellers of lake copper are trying to hold the market at 13 cents, but one interest is quoting 12.87½ cents. Electrolytic copper is sold in New York at 12.62½ cents. The exports of copper during August were large, amounting to approximately 27,000 tons. It should be noted that speculation in copper in London has recently been more active.

LEAD.

The market is quiet and without change, lead is selling at 4.40 to 4.45 cents in New York, and 4.30 cents in St. Louis.

SPELTER.

The spelter market is somewhat firmer, although the demand is limited. In St. Louis spelter is selling at 4.35 cents, and in New York at 4.30 cents.

PIG TIN CORNERED.

There seems to be a feeling among some interests that the present price of tin has been forced up altogether too fast. This may be true, but the consumption this year has been enormous, yet, with all this, it has not been far out of proportion compared with other metals. Consumption of other metals has been disappointing. Therefore, what will the result be when general business picks up and consumption of tin increases as it is bound to? It may be that tin will become a much higher priced metal than it is now. Nearly 40 per cent of all the tin produced in the world is consumed in the United States. There is no production in the United States, and there are no interests in the United States identified with the production of tin. It is produced in one part of the world, sold in London, and largely consumed in the United States, and for this reason consumers in the United States often have to pay tribute to the foreign sellers. Tin is now selling in 5-ton lots at 36 cents.

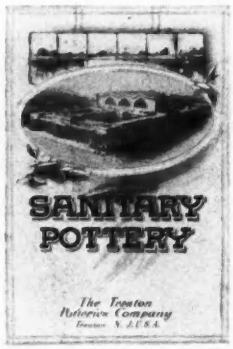
OLD IRON.

Coupled with the increasing demand for pig iron, a better inquiry for scrap is noted, particularly cast scrap. Steel scrap is likewise moving in better volume, although prices show only slight improvement. Quotations per gross ton for delivery in New York are as follows:

No. 1 yard wrought long	$12.00 to $12.50
No. 1 yard wrought short	11.50 to 12.00
Machinery cast	12.00 to 12.50
Wrought pipes and tubes	11.00 to 11.50
Wrought turnings	6.50 to 7.00
Cast borings	6.00 to 6.50
Stove plate	9.00 to 9.50

"SANITARY POTTERY."

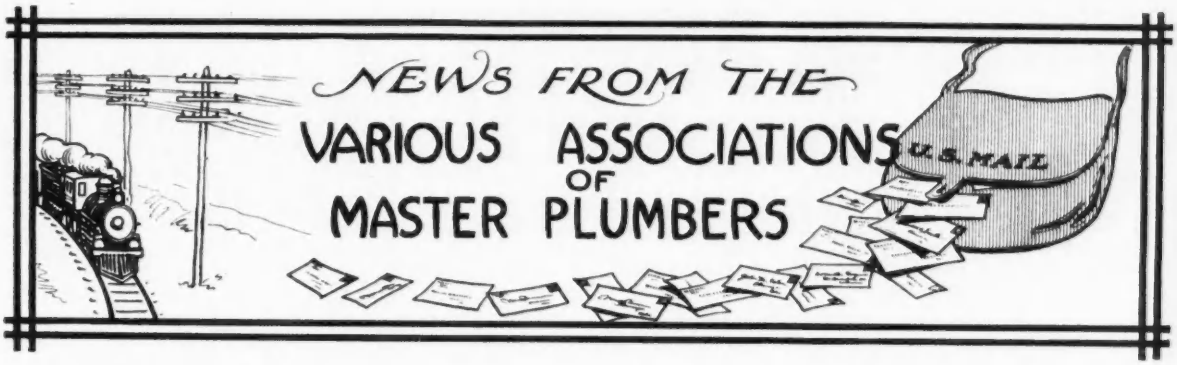
"Sanitary Pottery" is the title of an attractive little monthly publication issued by the Trenton Potteries Co., Trenton, N. J. The illustration shows the artistic front cover of the August issue. The object of the journal is to foster the interests of the sanitary pottery trade at large



and of the company's business in particular. The August issue commences a most interesting serial description of the great Pennsylvania Terminal station, New York City. The plumbing equipment will be described in detail. The illustrations are most instructive. You can receive all of these issues upon request to the Trenton Potteries Co., Trenton, N. J. Mention "Domestic Engineering" when you write. They like to know that you appreciate our journal.

The H. C. Lovell Co., Stratford, Conn., has secured the contract for the installation of a new steam-heating plant in the Washington school.

Geo. D. Ray, Belvidere, Ill., has been awarded the contract for interior plumbing work for the new Belvidere Screw and Machine Co.'s factory building. Schuyler Vandewalker secured the sewer. Mr. Ray also has the contract for the plumbing work in the new Catholic school building on Caswell street in Belvidere.



ASSOCIATIONAL PROGRESSIVENESS IN PITTSBURGH.

All glory is due the present administration of the Pittsburgh Master Plumbers Association, for out of a possible 300 master plumbers in the Greater Pittsburgh district, the association has a membership at this writing of about 217.

Time was, so it is reported, when the Pittsburgh association was almost devoid of life, but through the eloquence of diction in letters sent to non-members and letters of "uplift" sent the members by Secretary E. M. Tate, the association has been put on a high plane, and is now looked up to as one of the model associations of plumbers in the United States.

The officers are now arranging for a series of interesting winter-meetings, and some of the most noted authorities on plumbing, sanitation and building in the country are to be asked to appear before the Association.

The campaign for membership is being continued with unrelenting effort. It is common report that if the present administration continues its efforts while in office, there will be few master plumbers in the district who are not affiliated before the year's end.

The plan that is followed by the administration in keeping up the interest of the members is found in part in the following letter, which is only one of a series that has been sent to the enrollment by Secretary Tate:

Points Every Member Should Know About the Master Plumbers' Association.

Keep for Reference!

There is on file in the office of the secretary, information relating to sewer and street permits, plumbing rules, inspections and tapping for ferrules, in the boroughs adjacent to Pittsburgh.

The Borough of Millvale is enforcing an ordinance, which states that no one can do plumbing of any kind in the Borough, even to making water repairs, without first having taken out a license. Members are cautioned to make inquiry, before doing any work in boroughs.

The Master Plumbers' Association, through the Bond Committee, by their efforts in securing a reduction in the price of the Plumber's bond for opening of streets, saved the plumbers in the City of Pittsburgh, $2,000.00.

The Secretary has an arrangement with I. R. Carver, chief plumbing inspector, whereby members of the Master Plumbers' Association, having any grievance over any decision made in that office in regard to plumbing work, interpretation of laws, unfairness of plumbing inspectors, etc., can take their complaint to the secretary, who will consult Mr. Carver, and see that no injustice is done to any member.

The Secretary's office can be reached by 'phone any time between 8 a. m. and 5 p. m., for any information in regard to the association or plumbing business.

The association has been the means of discouraging "handy men" and unlicensed and incompetent plumbers, who have been doing plumbing work illegitimately.

Trade protection, means that the master plumbers will not countenance the sale of plumbing goods to the consumer, by manufacturer, jobber or by a master plumber, unless he is engaged to install same.

The Master Plumbers' Association is an asset to your business, if it did not exist, the plumbing supply business would be like the lumber business, dealers selling to anyone who wants the goods, at the same price the plumber pays. Under such conditions, your business would be demoralized.

Think this over carefully and see if it wouldn't be a good idea to keep the association in a flourishing condition, by keeping your dues paid in full. What about sending a check for the back dues you may owe at this time?

When it comes to seeking new members, a very happy letter is sent to those outside the fold, and the results already obtained by such letters are of the character that are worth the while.

The letter, which is one of a series now being sent to non-members of the Pittsburgh Association, reads as follows:

Letter to Non-Members.

Dear Sir:—At the last meeting of the Pittsburgh Master Plumbers' Association, it was decided, for a short period only, to reduce the initiation fee for membership in the association to $15.00, with no yearly advance dues, thus making an outlay of $15.00 instead of $41.00, as formerly.

The Master Plumbers' Association stands for trade protection, for without it, you would not be able to carry on your business.

Besides this trade protection, which is a most important feature, you are protected from unfair demands from your employes.

There is also an arrangement with the chief plumbing inspector, whereby, if a member has any grievance with that office, the matter can be taken up with the secretary, and adjusted through him.

There is also on file in this office, data relating to charges in surrounding boroughs, for inspections, sewer and street permits, ferrules, etc., which has been an advantage to our members when figuring work in the boroughs.

Through the efforts of the Association, the charge for street opening bond was reduced from $10.00 to $5.00, thereby saving the plumbers doing business in Pittsburgh over $2,000.

The Association has been the means of discouraging "handy men" who work for real estate dealers and large property owners, and many others, including journeymen plumbers, who do work at night, and some who have done work in the daytime, without a master plumber's license.

At our meetings, which are held on the first and third Tuesdays of every month, many practical points are often brought out by remarks made by our members, and a number of interesting and instructive addresses have been made at the meetings, among which were addresses by Dr. J. F. Edwards, Supt. Bureau of Infectious Diseases, and Dr. Beatty, Supt. Bureau of Sanitation.

It is to your own interest to affiliate with the Association, and your name was given to me as one who would make a desirable member, and I am sure you will not want to go along in your business, reaping many of the benefits of the organization, without contributing to its support; and now that the fee has been placed within the reach of all, I trust that you will take advantage of this splendid opportunity and return the enclosed application, with a check for $15.00.

We are not admitting any who are undesirable, and on investigation, believe you would be a credit to the organization.

Trusting that you will not let this opportunity pass, I remain,

Yours very truly,
Master Plumbers' Association.
E. M. Tate, Secretary.

THE NORTH SHORE MASTER PLUMBERS' ANNUAL OUTING.

The North Shore League of Master Plumbers, consisting of plumbers in Evanston, Wilmette, Kenilworth, Winnetka, Hubbard Woods and Glencoe, Ill., held its annual outing and picnic on Saturday, September 3rd, at Electric Park, near Waukegan, Ill. The League had issued invitations to the master plumbers in all the north-shore towns between Evanston and Waukegan, as well as to the Western Plumbing and Heating League, consisting of master plumbers in Aurora, Elgin, Joliet and LaGrange, and, as nearly all those who were invited accepted the invitation, it was an exceedingly well-attended picnic.

The nucleus of the party started from Evanston at 9 o'clock in the morning under the guidance of Geo. S. Moore, president of the League, on electric cars chartered for the occasion. These stopped at all the principal points along the route to pick up master plumbers and their families, who were found waiting and ready for the great annual affair. The cars arrived at the picnic-park shortly before 11 o'clock. The refreshment committee, consisting of George Long, E. J. Lyons and James Salmon, then put in a busy hour, with the result that they were able to announce everything in readiness for the first number on the program, the noonday luncheon, about 12 o'clock. The picnic-baskets were brought forth and an excellent lunch enjoyed, to which the refreshment committee added ice cream, coffee, lemonade and other liquids. Then followed an hour of the most delightful "dolce far niente" until about 2 o'clock, when the greatest event of the day was called, a baseball game between members of the Western Plumbing and Heating League and members of the North Shore League of Master Plumbers for the possession of a silver cup, donated by the Aurora Silver Plate Mfg. Co., of Aurora, Ill. The line-up was as follows:

North Shore League.		West Plbg. & Heat. League.
Geo. S. Moore	Catcher	C. S. Ruddy
Fred Schaefer	Pitcher	C. G. Perrin
F. J. Luettig	1 b.	W. J. Hilliard
Geo. Beck	2 b.	Geo. I. Kelly
A. R. Swanson	3 b.	O. A. Parre
J. Steiner	r. f.	W. C. Haviland
I. Park	l. f.	J. J. Ruddy
J. J. Cahill	c. f.	W. J. Taylor
J. Fitzgerald	s. s.	T. E. Walters

W. M. Forward, of the Mueller Furnace Co., of Chicago, acted as umpire.

The game was very interesting, probably more so than a game by professionals. Both teams were very enthusiastic and likewise confident of victory, the result being a hotly contested game and much brilliant playing. Capt. A. S. McKenna, of the North Shore League, urged his men on to do their best and he was supported by a host of fair fans. A. P. Manard, of Elgin, the only representative present from that city, performed a similar

Fair Fans Enjoying the Baseball Game.

The Cup that Caused the Scrap.

North Shore Suffragette Jury Verdict—No Cup, No Supper.

The Baseball Teams of the North Shore League and the Western Plumbing & Heating League.

service for the Western Plumbing and Heating League, also supported by fans of the fair sex. The result was that the North Shore League won by a score of 7 to 3, and thus secured at least temporary possession of the cup.

The North Shore players, who covered themselves particularly with glory, were: Messrs. Luettig, Beck, Fitzgerald, Cahill, Swanson and Schaefer. Among the Western League players deserving honorable mention were: Messrs. Kelly, Perrin, Walters and Haviland. During

The Ladies' Race at the Picnic.

the game "Domestic Engineering's" scribe heard once or twice the question made: "Has anybody here seen Kelly?" but it was entirely superfluous inasmuch as everybody saw Kelly and his famous home-run.

After the game the players posed before "Domestic Engineering's" camera as shown herewith.

A large number of races and contests for valuable prizes followed, in which more than thirty prizes were awarded. The most notable of these contests was the master plumbers' 100-yard dash, which resulted as follows: First prize, a box of cigars, J. Fitzgerald; second prize, a scarf-pin, T. H. Decker; third prize, a pocket-knife, W. J. Hilliard.

All the many games and contests were watched with the deepest interest by all who attended the picnic, and so thoroughly were they enjoyed by the spectators that everybody considered him- or herself lucky in being at the picnic and enjoying the fun.

A couple of hours of dancing was then enjoyed to excellent music furnished by Bloomfield's orchestra. Then followed lunch and refreshments, the last number of an exceedingly attractive and enjoyable program for a day's outing.

The entire party thereafter, it was now about 7 o'clock, wended its way back to the waiting cars and the homeward journey began.

Among the supply-men who graced the event with their presence were: I. Weil and B. Weil, of Weil Bros., Chicago, who came out in their new automobile, accompanied by H. O. Walker, manager of their heating department.

The credit for the great success of the outing is due to the untiring efforts of the many committees who had charge of the affair. These committees were composed as follows:

Baseball—A. S. McKenna, John O'Leary, Fred Schaefer.

Refreshments—George Long, E. J. Lyons, James Salmon.

Arrangements—Lee McDonough, George Park, John Clifford.

Transportation—Charles Wallace and J. W. Frye.

Dancing—M. L. O'Malia, John McKay, Fred J. Luettig.

Music—James Salmon and J. E. Fitzgerald.

Prizes—Conrad Schmeisser and James Park.

Judges of Contests—J. J. Cahill, John McKay, George Kearney, C. P. Sullivan and Robert Saxer.

Printing—George S. Moore.

Reception—E. T. Stokes, John Doose, Fred Burright, Joseph Steiner, A. R. Swanson, D. E. Clow, Charles Beck, T. H. Decker, A. F. Irons and August Specht.

CONTRACTS AWARDED.

Donahue Bros., Springfield, Mass., have been awarded the contract for plumbing the new Police building in that city. Consideration $6,758. W. J. Hyland Mfg. Co., also of Springfield, Mass., secured the contract for the heating installation in that building at its bid of $3,693.

Zephirin Rivard, Manchester, N. H., has secured the contract for the plumbing of the new addition to Martin's academy at Somersworth, N. H.

The Hanley-Casey Co., Chicago, has secured the contract for the heating of the new U. S. postoffice at St. Louis, Mo. Consideration $75,650.

The Noble Heating & Plumbing Co., Princeton, Ind., has secured the contract for the plumbing and heating in the Ward block on North Hart street in that city.

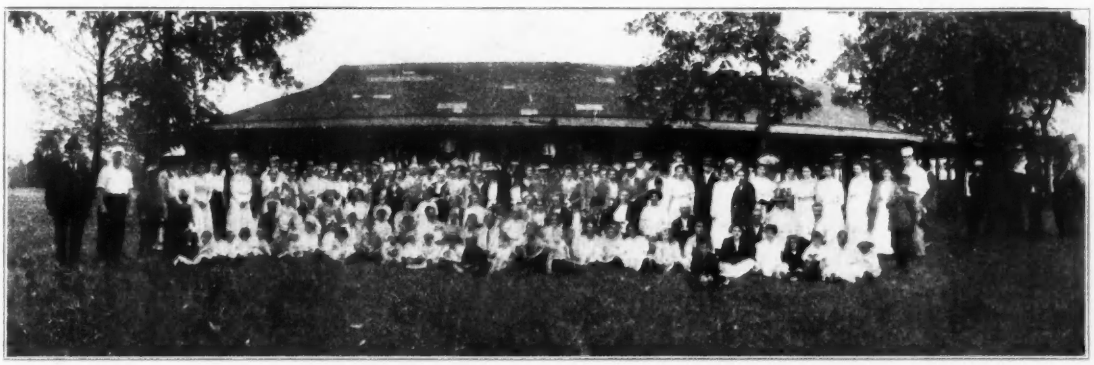
The Craighead Plumbing & Heating Co., Richmond, Ind., has been awarded the contract for the plumbing of the county infirmary. The contract amounts to $4,300.

The Weaver Heating Co., Columbus, O., has been awarded the contract for installing between 30 and 40 heating systems in the exhibit halls at the State Exposition grounds in that city, where the fourth annual National Corn Exposition will be held January 30 to February 11, 1911.

The St. John Plumbing Co., Colorado Springs, Col., has been awarded the contracts for the installation of heating systems in the 12-story Foster building, the 9-story Central National Bank building, and the 6-story Dr. Foster building, all in Denver. The three contracts amount to about $35,000.

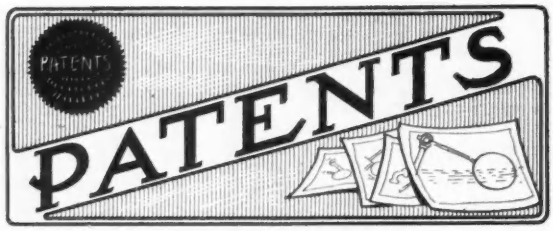
Wm. Hanrahan, 807 35th St., Chicago, has been awarded the contract for the plumbing and heating in the new additions to the Seventh Regiment armory.

P. K. Clayton, 1947 N. Western Ave., Chicago, has secured the contract for the plumbing in the Oak theater now being erected at the corner of Armitage and North Western avenues.



Panoramic View of the Picnickers of the North Shore League of Master Plumbers, at Electric Park, Waukegan, Ill.*

*The excellent panoramic view herewith shown was sent to "Domestic Engineering" by D. E. Walt, Waukegan, Ill., from whom postal card reproductions can be secured at the nominal cost of 10 cents.

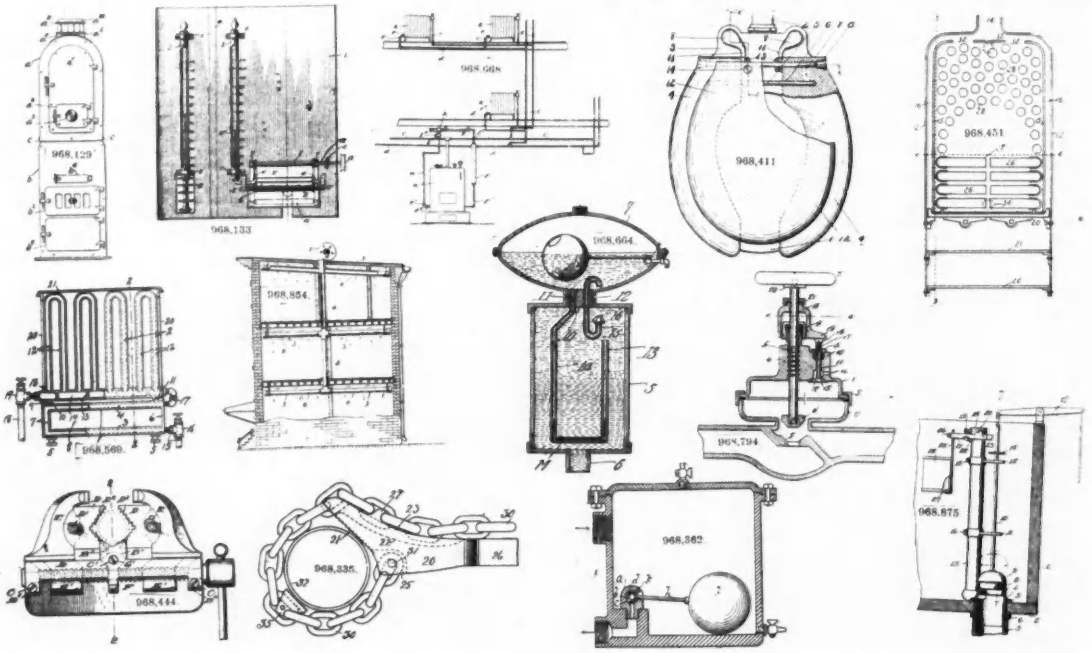


968,129. Water-Heater. George D. Cooper, Dayton, Ohio, assignor to Harry F. Schaeffer, Dayton, Ohio. In a heater, such as described, the combination of a two part outer casing and a two part inner heating device, the outer casing comprising an upper and lower part and the inner heating device comprising a water jacketed pot and a water wall and a series of water tubes connected at one end to said wall and closed at their outer ends and extending over the fire-pot, means for securing the two outer casings together, and means for securing the two part heating device, and supporting means projecting from one of the outer casings for supporting the inner heating device, tapered passage-ways extending through the bottom of the water wall and the top of the fire-pot

968,362. Plug-Valve. Thomas Keenan, Brooklyn, N. Y., assignor to Keenan Regulator and Steam Fitting Co., New York, N. Y., a Copartnership. A device of the kind described comprising a tapered plug and a housing with correspondingly tapered seat, the plug having a passage extending radially through the circumference of the plug and an axial passage through the plug connecting with the radial passage, said plug having a spring at its pointed end portion to draw the plug to its seat, a nut screwed to the plug to compress the spring and a shell seated about the spring to protect the same.

968,411. Water-Closet. Sylvester A. Quinn, Kalamazoo, Mich. In a structure of the class described, the combination with the bowl; a seat formed of two sections; a cover adapted to overlap both sections; a dowel rod connecting said seat sections, said sections being provided with dowel holes in their inner edges for said rod; a hinge connection for said cover and said seat sections to said bowl comprising hinge members secured to said bowl and projecting upwardly between said seat sections and bearing against the inner edges thereof; a pivot rod arranged transversely through said seat sections; a clamping nut for said rod whereby said seat sections are clamped upon said dowel rod; and hinge members for said cover arranged on said pivot rod between said seat hinge members and bearing against the same.

968,444. Vise. Lawrence R. Blackmore, Arlington, N.



and registering one with the other, substantially as specified.

968,133. Hygrometer for Regulating Humidifying and Heating Systems. Stuart W. Cramer and William B. Hodge, Charlotte, N. C.; said Hodge assignor to said Cramer. In a hygrometer, a wet bulb member, and means for maintaining the same at the temperature of evaporation, comprising a conveyer for supplying moisture to the bulb, means for drawing said conveyer across said bulb, and a receptacle for liquid in which the conveyer is immersed progressively.

968,260. Gas-Burner for Lamps. Harold D. Penney, Pelham, N. Y., assignor of one-half to William H. Reid, Brooklyn, N. Y.

968,335. Chain Tongs. Philip Farrell, Flushing, N. Y. In a chain tongs the combination of a jaw, gripping teeth on the jaw, one end of a linked chain pinned to the jaw below said gripping teeth, a shoe pinned to a link of the chain, jaws extending from the shoe with re-entering bearing surfaces, a crown in said shoe and said link bearing thereon, a second link engaging the re-entering bearing surfaces and also bearing on the jaws of said shoe, and teeth extending from the lower face of the shoe.

J. The improved vise herein described comprising a body portion provided with an upwardly projecting saddle section and having below said saddle section bearings, a jaw operating screws in said bearings and having right and left threads, blocks for holding the screw in its bearings, a side plate fitting over said blocks and retaining the same, said side plate being provided with a saddle section complementary to that of the body, and both said saddle sections being provided in their upper ends with depressed recesses forming seats for a pipe, means securing the side plate to the vise body, and pipe jaws operating between the saddle sections and having tapered toothed portions extending below the seats of the saddle sections.

968,451. Hot-Water Heater. Jessie Cooper, Dayton, O. A water heating device including a jacket; a water wall; a plurality of pairs of superposed, single unitary, closed-end, bent tubes, each connected with said water wall and forming therewith a fire-basket adapted to directly contain a mass of burning fuel, the closed ends of each pair of said tubes being adjacent to each other; a plurality of single, unitary, closed-end tubes each connected with said water wall within said jacket and above said fire-basket, the lower of said tubes being arranged

in the form of an arch to provide a combustion chamber above said fire-basket; and a fire door in said jacket communicating with said combustion chamber.

968,569. Combined Radiator and Foot-Warmer. James E. Jones, Syracuse, N. Y. In combination with a vertical radiator having a heating chamber therein, a base member consisting of a horizontal shelf and a heating chamber in said shelf, said radiator having downwardly projecting lugs, an upwardly and rearwardly inclined shelf of equal length with the aforesaid shelf, the upper rear of the horizontal shelf for its entire length, said inclined edge of the inclined shelf contacting the lower rear edge shelf provided with a heating chamber, upwardly projecting lugs provided upon the horizontal shelf co-acting with the lugs of the radiator to hold the same positioned upon said base, a conduit between the radiator heating chamber and one end of the chamber of the horizontal shelf, and a conduit between the opposite end of said horizontal shelf and the inclined shelf.

968,664. Regulator for Water-Heating Systems. Bert Humphrey, Charleston, W. Va. A regulator for water heating systems, comprising a vessel in communication with the system, an expansion chamber, a mercury sealed tube establishing a communication between the vessel and the chamber, a return flow tube leading from the chamber to the vessel, said return flow tube terminating in an upward bend within the vessel, a cage over said end of the tube, and a valve inclosed in the cage, and seating on the upturned end of the return flow tube.

968,668. System of Vapor-Vacuum Steam-Heating. Hosea K. Kriebel and Irwin Z. Kriebel, Philadelphia, Pa.

968,711. Hydrant. John W. Stevenson, St. Louis, Mo., assignor to Perley A. Griswold, St. Louis, Mo.

968,744. Water-Filter. August A. Danielson, Jamestown, N. Y., assignor of one-third to Conrad T. Johnson and one-third to Henry A. Larson, Jamestown, N. Y.

968,794. Stop-Cock and Drain-Valve. William E. Peare, Cincinnati, O.—In a device of the character specified, the combination with a supply valve having a valve stem, of a drain valve, connected with the chamber of said supply valve, having a valve stem, a sleeve loosely mounted on the stem of said supply valve and bearing on the stem of said drain valve, means to hold said drain valve closed against the normal pressure of said sleeve, means on the stem of said supply valve to force said sleeve against the stem of said drain valve, whereby said drain valve is opened during the closing of said supply valve, and means to regulate the interval of such force, relatively to the operation of said supply valve, without interrupting the use of said supply valve.

968,854. Ventilating System. John W. Jones, Roosevelt, Okla. The combination with a building, of a ventilating system of the character described comprising a fan mounted on the roof of the building and provided with a screened intake to exclude foreign particles, a fresh-air supply pipe having connection with the fan and extending downwardly through the floors of the building, and distributing pipes connected to the supply pipe and leading therefrom into the respective rooms on each floor, the distributing pipes being arranged in proximity to the ceilings of the rooms and being imperforate with the exception of upper and lower longitudinal series of outlets extending therethrough at diametrically opposite points, the series of outlets of each distributing pipe being disposed in a vertical plane, the lower outlets directing the fresh air vertically downwardly into the room and the upper outlets directing the fresh air against the ceiling of the room, whereby the air is deflected laterally by the ceiling to insure of the thorough distribution thereof.

968,875. Flush-Valve. John S. Morrissey, Laconia, N. H. A flush valve for tanks comprising a pipe section adapted to connect with the exit of the tank and provided with a valve seat, an overflow pipe connected to said pipe section below said valve seat and extending upwardly therefrom, vertically-aligned guides supported by said overflow pipe above said valve seat, a weighted valve provided with a stem sliding in said guides into and out of co-operation with said seat, a projection on the valve stem, a lever fulcrumed near the upper end of said overflow pipe, a trip at one end of said lever yielding to the said projection in its upward movement and passing beneath the same, a receptacle connected to the other end of said lever having a filling opening below the normal water level of the tank and having a drain opening at its bottom.

To The Trade:-

We are prepared to give you the utmost value in heating requirements.

Our boilers are the Capitol, Furman, Sun and Solar in both round and square.

In radiators we can furnish every height, kind or shape needed, either slip nipple or screw nipple construction.

Every specialty needed for a heating plant can be supplied by us.

United States Radiator Corporation

SUCCESSORS TO

United States Radiator Co.
United States Heater Co.
United States Radiator & Boiler Co.
Herendeen Mfg. Co.
Central Radiator & Foundry Co., Paola, Kansas
Heating Dept. of J. L. Mott Iron Works

Home Office---Dunkirk, N. Y.

Branches in Principal Cities

Classified Advertisements

Advertisements under this heading 4 cents per word per issue, address included. Remittance to be made with order. To insure insertion copy should be received not later than Wednesday morning.

Situations Wanted

WANTED—POSITION ON OR ABOUT October 1st to take charge of shop; will invest small amount; 20 years' experience in plumbing and heating business. Address No. 399, "Domestic Engineering," Chicago.

WANTED—POSITION AS SALESMAN for good manufacturing company, by experienced man now employed, in heating, plumbing and supply business, acquainted with trade in Ohio and Kentucky; references. Address No. 398, "Domestic Engineering," Chicago.

POSITION WANTED—BY SOBER, INdustrious young man, experience in the heating business. Not afraid of work. Address No. 412, "Domestic Engineering," Chicago.

SUPERINTENDENT AND ESTIMATOR with 5 years of experience would like to correspond with heating and plumbing firms in need of such a man. Address No. 409, "Domestic Engineering," Chicago.

WANTED—WORK WITH A HEATING engineer or contractor by young man, age 21, technical graduate, can lay out and prepare plans, estimates, etc. Address No. 424, "Domestic Engineering," Chicago.

FIRST-CLASS AUDITOR SEEKS POSItion evenings checking up accounts or invoices; is an expert in plumbing line and familiar with new enamel-ware prices. Address No. 394, "Domestic Engineering," Chicago.

WANTED—POSITION BY YOUNG MAN who speaks both English and German fluently as bookkeeper and general office man with a plumbing or heating firm. Have had several years' experience in these lines. Address No. 415, "Domestic Engineering," Chicago, Ill.

Help Wanted.

WANTED—A GOOD MAN WITH SOME experience; sober, ambitious, and willing to work to sell Water Lifts. Address No. 450, "Domestic Engineering," Chicago.

WANTED—MANAGER TO TAKE ENtire charge of a concern manufacturing plumbers' cast-iron enamel ware. Address No. 391, "Domestic Engineering," Chicago.

WANTED—SEVERAL ENERGETIC salesmen who are alive to grasp a good money-making side line; can sell from small model or photograph. Address No. 414, "Domestic Engineering," Chicago.

WANTED—RELIABLE, COMPETENT salesman to sell steam, hot water and hot-air heaters and heating supplies. Desirable position for right man. Address No. 420, "Domestic Engineering," Chicago.

WANTED—COMPETENT FOUNDRY foreman for plumbers' and steam brass work. First-class executive man wanted. Must be able to produce credentials which prove him such. Address No. 421, "Domestic Engineering," Chicago.

For Sale

FOR SALE—PLUMBING AND HEATING business in Michigan town, 18,000 population; good reason for desiring to sell; a bargain. Address No. 408, "Domestic Engineering," Chicago.

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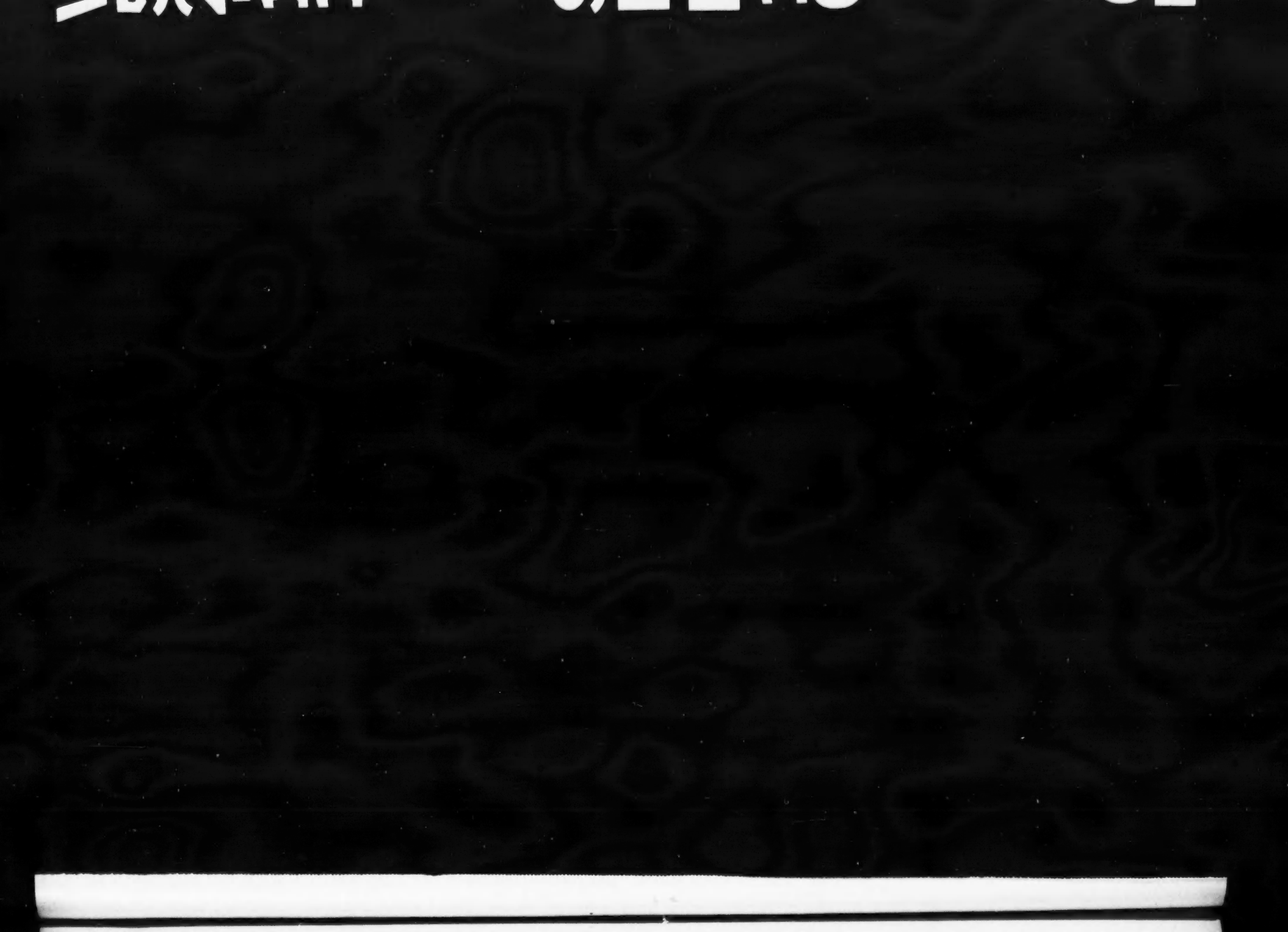
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